A

GENERAL SYSTEM OF SURGERY.

IN THREE PARTS.

CONTAINING THE

DOCTRINE and MANAGEMENT

I. Of WOUNDS, FRACTURES, LUXATIONS, TUMORS, and ULCERS, of all Kinds.

II. Of the ſeveral OPERATIONS performed on all PARTS of the BODY.

III. Of the ſeveral BANDAGES applied in all OPERATIONS and DISORDERS.

The Whole illuſtrated with Thirty Eight COPPER-PLATES, exhibiting all the OPERATIONS, INSTRUMENTS, BANDAGES, and IMPROVEMENTS, according to the Modern and moſt approved Practice.

To which is prefixed an

INTRODUCTION

Concerning the *Nature*, *Origin*, *Progreſs*, and *Improvements* of *SURGERY*; With ſuch other PRELIMINARIES as are neceſſary to be known by the YOUNGER SURGEONS.

Being a Work of THIRTY YEARS Experience.

Tranſlated into *ENGLISH* from the *LATIN* of

DR. *LAURENCE HEISTER*,

Profeſſor of *Phyſic* and *Surgery* in the Univerſity of HELMSTADT, Fellow of the Royal-Society, LONDON, and of the Royal Academy at PARIS, *&c.*

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THE TRANSLATOR's PREFACE.

THE Tranſlation of the Book before us, which now appears in the World, will obviate a Complaint frequently made among the junior Surgeons, and Pupils of this Art in *England*, *viz.* that they are in Want of a general Syſtem capable of inſtructing at large one that is a Learner in Surgery, for the Execution of all the Branches of his Profeſſion; and this, till now, might indeed be affirmed with ſome Juſtice. It is true, the ſeveral Branches of Surgery have been tolerably well handled by various Authors at different Times, and in ſeparate Treatiſes: Some have confined themſelves to Wounds, Fractures, Luxations, Tumors, and Ulcers, which make the Subject of the firſt Part of the preſent Syſtem; others have wrote profeſſedly on the Operations, Inſtruments, Bandages; or miſcellaneous Obſervations appertaining to the Practice of Surgery; and others have given us ſhort Introductions to the whole; but in no one Book, except the preſent, do we meet with all theſe Branches treated in that ample, eaſy, and intelligent Manner, which is neceſſary for the firſt Information of Beginners, or the occaſional Conſultation of the more advanced. We have in this Work not only the

beſt and moſt modern Methods of Practice uſed by the principal Surgeons of the ſkilfulleſt *European* Nations, but alſo exact Figures of their ſeveral Inſtruments and Bandages, with the Methods of uſing or applying them in all Chirurgical Caſes whatever; the whole Doctrine of which is here explained in the minuteſt Circumſtances, and brought down even to the loweſt Capacities. In ſhort, no Character of the Book can ſo well recommend it to the Reader as his own Peruſal, and the Author's Preface following.

THE AUTHOR's PREFACE.

AFTER having ſtudied Phyſic with great Aſſiduity above four Years in our *German* Univerſities, my Affections, being ſtrongeſt for *Anatomy* and *Surgery*, led me to the then celebrated Profeſſors RUYSCH and RAW at *Amſterdam* in the Year 1706, whoſe anatomical and chirurgical Demonſtrations I diligently attended for about the Space of a Year; during which Time I was alſo employed in frequent Diſſections, and in trying chirurgical Operations upon dead Subjects, in the mean Time omitting no Opportunities of being preſent at the Performance of any conſiderable Operation by theſe Profeſſors, or by the other eminent Surgeons of the ſame City. By which Means, joined with an attentive Reading of the beſt Writers, I acquired a conſiderable Knowledge in Surgery.

But being deſirous of all Helps to render myſelf more expert and ſucceſsful in the Practice of this Art, there being at that Time a ſharp War in *Flanders* betwixt the *French* and *Dutch*, in the Summer following, *viz.* in the Year 1707, I went from *Holland* to the *Dutch* Camp in *Brabant*, that I might inſpect and obſerve the Practice of the *Engliſh*, *Dutch*, and *German* Surgeons, who there attended. Thus, through many Dangers and Hardſhips, I ſpent this whole Summer in the Hoſpitals of the Camp, for the Sake of Improvement. But in Autumn I went from *Brabant* to *Leyden*, and ſpent the whole Winter in attending the Lectures of the then celebrated Profeſſors in that Univerſity, BIDLOO, ALBINUS ſenior, and BOERHAAVE; and thus I continued till the Beginning of the Summer 1708. After which, having taken my Degree of *Doctor*, I returned again to the Camp, where I found large Opportunities of learning and improving myſelf in Surgery,

gery, from the Multitude wounded, *&c.* in the ſeveral bloody Fights, particularly at the Siege of *Liſle*, and the Battles of *Oudenarde* and *Wynendale*. Upon the Approach of Winter again, I was determined to ſettle in the Practice of *Phyſic* and *Surgery* in *Holland* at *Amſterdam*, partly from the Delight I had in the Country, and partly through the Solicitations of the famous RUYSCH, who reſpected me as a Son. Here therefore I ſtayed the Winter, and Part of the enſuing Spring, teaching *Anatomy* and *Surgery* to Students and Gentlemen, as RAW had done before me, who was now rejected for his ill Conduct or Miſbehaviour.

The following Summer, in 1709, I had ſtill a ſtrong Deſire to follow the Camp, to become more and more perfect in the Practice of *Surgery*; and *Tournay* being at that Time inveſted by the confederate Army in *Flanders*, I was, by the Recommendations of my Friend RUYSCH, appointed Phyſician to the Camp-Hoſpital for the *Hollanders*; ſo that I had now an Opportunity of performing all the chirurgical Operations which offered in the Camps and adjacent Cities, which I generally executed with Succeſs. After the taking of *Tournay*, the confederate Army marched to beſiege *Mons*, near which Place the *French* Army was alſo aſſembled. That, however, did not prevent us from inveſting and taking the City, before which the numerous Army had firſt ſuch a bloody Battle, that the wounded were brought in upon us in Crouds, and their Number continually increaſing, from the uncommon Heat of the Combat, every Surgeon had now his Hands full of Buſineſs, and infinite Calls for the Practice of his Art; for the Number wounded, on the Side of the *Hollanders* only, amounted to above five thouſand. I had here therefore an ample Occaſion to extend the Bounds of my Practice, and was obliged to put on that Intrepidity of Mind which CELSUS requires as an eſſential Qualification in a Surgeon, and for want of which ſome, who are in other Reſpects ſkilful Operators, do frequently miſcarry.

After the Army had entered into their Winter-Quarters, and the wounded Men recovered, I returned again to *Amſterdam*, where I continued my *Anatomical* and *Chirurgical* Demonſtrations this Winter as before; and in the mean Time I never refuſed my Aſſiſtance at the Operations of the other Surgeons there.

But in the Beginning of the Spring following, 1710, I was, beyond all Expectation, called by the Republic of *Norimberg* to teach *Anato-*

my

my and *Surgery* as public PROFESSOR in the Univerſity of *Altorf*. Being therefore unwilling to neglect this honeſt and uſeful Calling, having obtained Leave from the Republic, I firſt made a Tour into *Great Britain*, where I was, from Spring to Autumn, collecting every thing new in the ſeveral Branches of Phyſic, and then, returning to *Norimberg* and *Altorf*, I aſſumed my new *Profeſſorſhip*.

In this Station I was under a Neceſſity of teaching publicly, among the other Parts of *Phyſic*, that moſt ancient, neceſſary, and uſeful Branch of it which we call *Surgery*, and which I had before taught privately during the two preceding Winters in *Holland*; but in doing this I was much perplexed for want of a convenient Manual, or compendious Syſtem of the Art, to aſſiſt and inform thoſe Learners who attended my Lectures. To our want of ſuch a *Compendium* I alſo attributed the general Ignorance and Inſufficiency of the young Surgeons and Students in this Branch of *Phyſic*, which at that time univerſally prevailed, through *Germany* eſpecially. And from the ſame Cauſe the Generality of our Surgeons being unequal to the more difficult Operations, were content with being able to cure a ſlight Wound, open a Vein or Abſceſs, or at moſt to ſet a Fracture, and reduce a Luxation; leaving thoſe Diſorders and Operations which required the greateſt Skill to the Management of daring Quacks and itinerant Operators, with which *Germany* at that time ſwarmed.

If any one examines the beſt Books, ſuch as the *Microtechnia* of VAN HOORN, the *Operations* of NUCKE, *&c.* which were at that Time conſulted not only by our Surgeons, but alſo by our Univerſity-Profeſſors for teaching and learning the Art, it will readily appear how imperfect and inſufficient they are to give a juſt Notion of any one Branch, much more of the whole Syſtem or Body of Surgery. Since they deſcribe only a few of the Operations, and thoſe too imperfectly; taking little or no Notice of the Doctrine and Treatment of Wounds, Fractures, Luxations, Tumors, and Ulcers, which make the moſt conſiderable Part of Surgery, and in which a Learner ought to be the moſt fully inſtructed. It is true, the Works of GUIDO CAULIACUS, AQUAPENDENS, PARET, SCULTETUS, SOLINGEN, and ſome other Writers of the laſt Century, are very full and explicit in all or moſt of the Operations, and the five Kinds of Diſorders before-mentioned; but even in theſe we muſt not expect to find the many Improvements, Emendations and Diſcoveries made by the Moderns: And their Practice being moſtly obſolete, they muſt conſequently be allowed to be

unfit for the Inſtruction of Learners. And it is an Objection to many of our Books in Surgery, of a more modern Date than the preceding; that they have been either compiled by Phyſicians, little converſant in chirurgical Diſſections and Operations, as thoſe of BARBET, VERDUC, VAUGUION, LE CLERC, *&c.* in which many of the old Errors are continued, and not a few Things ſtated otherwiſe than will be found in Practice; or elſe they have been reſtrained to but one or two Subjects only, as the Bones, Wounds, Tumors, Bandages, Operations, *&c.* beſides their being wrote either in the learned, or a foreign Language unknown to moſt of our Surgeons.

Theſe were chiefly the Motives that firſt induced me to attempt the Compoſition of a chirurgical Syſtem, to be ſubſervient to my own Lectures and Auditors; in doing which I endeavoured to take in all the more uſeful Part both of our ancient and modern Writers in every Branch of Surgery, rejecting what appeared uſeleſs or obſolete, and comparing or correcting the whole, conformably to my own Experience, and what I had ſeen in the Practice of the Art under many of the moſt ſkilful Surgeons and Phyſicians. And thus, from time to time, I endeavoured not only to correct and complete my Collections and Remarks, ſo as to take in every, even the minuteſt, Part of Surgery; but alſo I digeſted and diſpoſed the whole in the Method which appeared to me the moſt natural, and the beſt adapted both for the Teacher and Learner.

Theſe my firſt Labours I writ originally in *Latin*, in which Language they were alſo delivered to my Hearers, and permitted to be *tranſcribed* by them; but conſidering the immenſe Fatigue that this Method of obtaining it gave the Student, with the great Loſs of time, which he might have otherwiſe employed to more Advantage, I was at length determined to *publiſh* it in *Latin*, in the Manner I had then compoſed it. But conſidering the Ignorance of our *German* Surgeons at that time of Day, as well in the *Latin* Tongue, as in their own Profeſſion, it being chiefly compoſed and intended for them, I now judged it would be more uſeful to print the Book in our native *German*; that then both the learned, and ignorant of the *Latin*, might have the ſame Benefit of it. Accordingly I tranſlated and ſent it to the Preſs in the Year 1717, and in the Year following, 1718, it was publiſhed as my *Surgery* in 4to at *Norimberg*, being illuſtrated with Copper-Plates exhibiting the beſt Inſtruments, *&c.* And from this time it is that we have had better or more expert Surgeons in *Germany* than

than before; many of which have ſince often declared to me, that they had drawn moſt of their Knowledge from my Surgery.

I intended ſoon after to have publiſhed the Book in *Latin*, for the Sake of *Foreigners*; but in the Year enſuing I received a moſt gracious Call to the public Profeſſorſhip of *Anatomy* and *Surgery* in the *Julian* Univerſity of *Helmſtadt*, from his *Britannic* Majeſty, as Duke of *Brunſwick* and *Lunenburg*, under whom the Univerſity flouriſhes, and is liberally ſupported; ſo that what with the Care and Trouble of packing up, and removing my Goods, and the Fatigue of a long Journey, added to the Multitude of Buſineſs, and many Avocations conſequent on my new Office, I have been obliged to delay the *Latin* Edition of my Surgery much longer than I ever thought or deſigned. However, the *German* Impreſſion was ſold off in a little Time, and the Bookſeller urging for a ſecond Edition, as there were ſeveral Improvements made lately in *Surgery*, particularly in *Lithotomy*, I therefore reviſed, corrected, and enlarged the Book, according to the later Diſcoveries, and my own recent Obſervations ſince made, ſo as to fit it then for a ſecond, and ſome time after for a third Edition. But then this, with other Avocations in the mean time, prevented me from compleating the Work in the learned Language for the better Sort of Readers, ſo as to make it correſpond to the Performances of foreign Authors, with which our *German* Surgeons were unacquainted.

But being at length ſolicited, as well by many learned Phyſicians and Surgeons of other Nations, as by my Bookſeller at *Amſterdam*, to publiſh my Surgery in *Latin* for the Advantage of Foreigners; and being unwilling to deny the Requeſt, I have now, notwithſtanding my academical and practical Buſineſs, made ſhift to print it in that Language, in many Places much enlarged and amended beyond any of the preceding Editions; hoping that it may be a Means of inſtructing young Surgeons in all the Branches of their Profeſſion, according to the beſt modern Diſcoveries and Improvements which have been made in the Art. I have here endeavoured to preſent them with the whole Body of Surgery together, that Learners eſpecially may not have their Knowledge to ſeek in many different Books, by turning over ſome upon Wounds; others upon Fractures, Luxations, Tumors, or Ulcers; and others again upon Operations, Inſtruments, or Bandages; all which I think are here ſufficiently explained, not only for the Inſtruction of Learners, but all the Purpoſes of the more advanced.

The *AUTHOR's* PREFACE.

Whether I have ſucceeded in this Taſk, muſt be left to the Determination of more prudent and impartial Judges; but this I may be allowed to ſay, that I have uſed my beſt Endeavours to promote the Glory of GOD, and the public Good, by theſe Labours of their

Devoted Servant,

Holmſtadt
Jan. 10, 1739.

THE AUTHOR.

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A GENE-

A GENERAL INTRODUCTION TO SURGERY.

Of the Nature, Conſtitution, Origin, Progreſs, Improvement, and Diviſion of Surgery; *and of other Things in general, which are principally neceſſary for Students in* Surgery *to be acquainted with.*

1. THE principal end of *Phyſic* is to prevent or relieve the diſorders of the human body. This the firſt Phyſicians endeavoured to effect by three means, either by *Food*, *Medicines*, or the *Application of the hand*[a], or by all together, if the Caſe acquired it: which method, reaſon and experience teach us, is abſolutely neceſſary at this time. And of theſe three branches of this ſalutary Profeſſion, they called the firſt *Diet*, or *dietetical* (διαιτητικὴν); the ſecond *Pharmaceutical* (Φαρμακευτικὴν); and the third *Chirurgical* (χειρουργικὴν). For ſince the end of *Phyſic* could by no means be always obtained by *Diet* and *Medicine* alone, (though they are of very great ſervice in preſerving and reſtoring the Health of Mankind), but Manual Operation is alſo found ſometimes to be abſolutely neceſſary; it is plain therefore that this branch of *Phyſic*, which is called *Surgery*, is very neceſſary to Mankind, but above all becauſe it appears that by this means many grievous diſorders are relieved, as Wounds, Fractures, Luxations, and ſeveral others, where *Diet* and *Medicine* would afford very little, and ſometimes no help at all. But that the excellence and neceſſity of this Art may appear more clearly, it may be neceſſary to obſerve that the Arts only conduce to the conveniences of life, but the art of *Surgery* is frequently neceſſary for the preſervation of life and health. This neceſſity appears more particularly in dangerous Wounds received in war, ſkirmiſhes, or ſieges, where many brave men muſt neceſſarily periſh from loſs of blood, and other cauſes, unleſs they were reſtored, and ſnatch'd (as they ſay) from the jaws of Death, by the ſkill of their Surgeons. And no doubt the better opinion the Soldiers conceive of their Surgeons, the more ſpirits have they for the combat, having good confidence that the Wounds they receive ſhall be properly treated and their Lives preſerved. And from

[a] *See* Celſus, Præf. Lib. I. pag. 3. *Edit.* Almelov. & Patav.

hence, because Surgery is chiefly exercised in the treatment of Wounds, it is called by the *Germans* the cure for Wounds *(Wund-Artzeney)* not as if Wounds were the sole objects of *Surgery*, but as it is of more particular and frequent service in cases of that kind.

Surgery, what.

II. "*Surgery*, *says* Celsus [a], is that branch of Physic which informs us how "to cure or prevent disorders by the assistance of our Hands or Instruments, "or by the application of external Remedies," as disorders are frequently prevented by Bleeding, Scarifying, opening of Issues, and by Setons, *&c.* Since therefore *Surgery* is properly the Work of the Hand, it is very justly called by the *Greeks* Χειρουργία, from the two *Greek* words of that signification, Χεὶρ and Ἔργον, from whence the person also skilled in this Work was called a *Chirurgeon*. But he whose office it is to cure disorders only by administring Medicines internally, and by prescribing rules for the regulation of the Diet, is at present in *Latin* called *Medicus*; though this is a modern distinction, and unknown to the Ancients, among whom both offices were performed by the same person, as appears plainly by the writings of *Homer*, *Hippocrates*, *Celsus*, and many others.

It may be called a *Science* and an *Art*.

III. Some call *Surgery* a *Science*, others an *Art*: but, in my opinion, it will claim either appellation. For it may be called a *Science*, because the Student in Surgery before he is skilled in the method of healing, must have acquired the precepts or foundation of what is to be done towards discovering and remedying disorders that are to be relieved by the Assistance of the Hand, from *Anatomy*, *Physics*, and *Mechanics*, without which Knowledge he would not only go very idly to work, but would do more harm than good to his Patients, and consequently to the Public. It also well deserves the name of an *Art*, when any one is so well versed in the Elements of this Art, that he is able to preserve the Body sound, as well as to relieve it when it is otherwise: hence we very properly say, those who are skilled in the *Art* of *Surgery*, who are ready at healing Wounds, replacing fractured and dislocated Bones, and understand the right methods of treating other disorders which require the Assistance of the Hand or Instruments. From hence, I imagine, arose the distinction which some have made between *theoretical* and *practical Surgery*. Looking upon *Surgery*, when ranked under the first denomination, as a *Science*, as when a man has learnt and understands the rules, and the reasons upon which those rules are grounded, which teach the best methods of treating disorders that call for the *Surgeon*'s hand, and in what manner *Operations* (as they are vulgarly called) are to be performed, but never attempts the performance of any of these *Operations*, whether they are dividing, amputating, cauterising, or reducing Bones, or of any other kind: This *Science* we call *Medical Surgery*. And this branch of *Surgery*, at least, all regular *Physicians* ought to be well acquainted with, that they may be of service to the *Surgeons* and their *Patients*, by being able to give prudent advice in disorders of this kind. *Surgery*, when it falls under the second denomination, and is termed *practical*, signifies the exercise of it, or the *Art* of performing Chirurgical Operations, and of replacing, tying, cutting, extirpating, dividing, cauterising, *&c.* The *practical Surgeon* is well instructed in the art of managing his Hands and Instruments dexterously

[a] Lib. I. Præfat. pag. 3. *and* Lib. VII. *in the beginning of the* Preface.

in

in the performance of ſuch operations as the neceſſity of the caſe ſhall require. Much the greater part of the modern *Phyſicians* have been content with the knowledge of the former part of *Surgery*, leaving the execution of the latter, which is much to be lamented, to unſkilful Quacks and [a] Mountebanks. This happens partly becauſe the diſorders that are curable by the prudent adminiſtration of Medicines internally, and a well-regulated Diet, which more immediately come under the province of the Phyſician, are ſo numerous, and withal ſo intricate, as to be a ſufficient exerciſe for his whole Study; and partly becauſe cures which are to be performed by the Hand, eſpecially thoſe which are attended with great danger and cruelty in the execution of them, require a ſingular hardineſs of temper and reſolution of mind; or, as that *Cicero* of the *Phyſicians*, *Celſus*, ſpeaks, "[b] An intrepid mind void of all tenderneſs and "pity, and entirely deaf to the Shrieks and Outcries of the ſuffering Patients:" Which is to be met with in very few, though they may be perfectly well acquainted with every thing that ought to be done. But whoſoever deſires to be a perfect *Surgeon*, muſt be a thorough Maſter of his Profeſſion under both heads, as a *Science* and as an *Art*: and in ſuch manner that the *theoretical* Part, or knowledge of the Elements, (in which *Anatomy* claims the firſt place) ſhould precede the exerciſe of the Art. For if any one ſhould be bold enough to proceed in the contrary method, and invert this rule, by undertaking to perform Operations, eſpecially thoſe of the more difficult kind, before he had made himſelf well acquainted with *Anatomy*, the nature of Diſeaſes, and what is proper to be done towards removing of them; of neceſſity he will do great harm to thoſe entruſted to his care, and deſtroy more than he will ſave; though this, the more is the pity, is every where practiſed by bold daring Fellows, to the great detriment of mankind, and to the diſgrace of this truly noble Art. For [c] "Knowledge ought to direct the Hands, and ſhew "them what is proper for them to perform." Therefore if any *Surgeon* has been long in practice, and, as they are fond of terming it, is a *Man of great Experience*, and is not thoroughly verſed in *Anatomy*, and the Inſtitutions of *Surgery*, his actions are always doubtful and uncertain, and are ever obnoxious to multiplicity of dangers. Therefore it is neceſſary for the good Surgeon to be a thorough Maſter of both; but he that at the ſame time underſtands the other branches of *Phyſic*, as many amongſt the ancient and modern *Phyſicians* have done [d], is by ſo much the greater and more perfect *Surgeon*.

IV. The end of *Surgery*, as appears by what we ſaid above at N° I. is threefold: 1. *To preſerve mankind in a ſound State*, in the manner we explained it at N° II. 2. *The Reſtitution of a ſound State if it is wanting*; that is the cure of diſorders by the aſſiſtance of the Hands. Or, 3. *To preſerve the Life of a Man*, though it be with a maimed and wounded Body, if it is impoſſible to render it entire again. This third end is chiefly obtained by the amputation The end of Surgery.

[a] *This is very rarely the caſe in* England, *but too common in* Germany. [b] Lib. VII. in Præfat. [c] Celſus *ſpeaks more largely of this*, Lib. I. in Præfat. [d] *As* Æſculapius, Podalirius, Machaon, Hippocrates, Galenus, Celſus, Ætius, Ægineta, Oribaſius, Guido Cauliacus, Salicetus, Veſalius, Fallopius, Marianus Sanctus, Jo. de Romanis, Varolius, Cabrolius, Fabr. ab Aquapendente, M. A. Severinus, Hildanus, Spigelius, Glandorpius, Geigerus, Scultetus, Marchettus, Rolfincius, Wepferus, Muraltus, Solingenius, Ruyſchius, Bidlous, Nuchius, Groenveltius, Cyprianus, Bohnius, Brunnerus, Rauius, Leuſdenius, &c.

of ſphacelated, cancerated, or carious Limbs; ſo in Cancers, Schirrus's, old Ulcers, and other ſuch like incurable diſorders, and in ſeveral diſorders of the Head, eſpecially in weakneſſes of the Eyes and Ears, to prevent their growing worſe it is uſual to order Fontanelles, Setons, frequent Blood-letting, Bliſtering, *&c.* though a perfect cure is not perhaps to be looked for.

Auxiliaries of Surgery, what.

V. The *Auxiliaries* or *Means* which *Surgery* makes uſe of to obtain the ends we have been diſcourſing of, are chiefly the *Surgeon's Hands* and proper *Inſtruments*. For as often as a fractured or diſlocated Bone is to be reduced, a Stone to be extracted, or a Cataract depreſſed, proper Inſtruments are always neceſſary. But that every thing may go on with more ſpeed, eaſe, and ſafety, the adminiſtration of proper internal Remedies, and the regulation of Diet, will never be neglected, in any of the foregoing caſes, by a prudent *Surgeon*. From whence the veracity of *Celſus*'s ſentence plainly appears. "[a] That all "the parts of Phyſic are ſo intimately connected, that it is impoſſible to ſepa- "rate any one of them entirely from the whole." And in another place[b], "I, *ſays he*, can eaſily conceive one man to be capable of performing all the "offices of Phyſic, and where they have been divided, think him praiſe-worthy "that unites them in himſelf."

Origin of Surgery.

VI. The ſtrong connection that there is between *Phyſic* and *Surgery*, is, in my opinion, a perſuaſive argument that the Origin, Progreſs, and Fate of both, were always the ſame. Though, to ſay truth, I cannot help believing with *Celſus*[c] and others, that *Surgery* is more ancient than any other branch of *Phyſic*, and near coeval with mankind, and therefore the true Parent of *Medicine*. The nearer mankind was to its firſt original, at ſo much the greater diſtance were they from luxury and debauchery, and of conſequence ſo much the farther removed from internal diſeaſes. The native ſtrength of man, as yet unhurt by intemperance, ſtood in no need of internal Aids. But on the other hand, even in the earlieſt times, men were liable to external injuries, which require the aſſiſtance of the *Surgeon's* Hand: for who in thoſe days was ſecure from falling, or from Fractures of the Bones, which are the conſequences of ſuch accidents; from the Bites of wild Beaſts; or from the Wounds of an open or an inſidious Enemy? ſince in the very firſt ages men waged war with each other, can it be reaſonably ſuppoſed that they were always free from Bloodſhed, fractured and diſlocated Bones, *&c.* As therefore it cannot be doubted, but that by the direction of Nature, who taught them to extract Thorns, and to tie up Wounds, to prevent a large effuſion of Blood, they by degrees were uſed to receive aſſiſtance from the hand of ſome kind of Inſtruments; and if by chance, after many repeated experiments of this kind, any thing ſhould be found to anſwer the deſired end, diligent men would certainly retain it in their memories, and mark it down: which being repeated with ſucceſs, in ſimilar caſes, was handed down to poſterity. So this ſalutary Profeſſion took its riſe from ſmall, and thoſe rude beginnings and vulgar experiments, till by degrees it received improvements, and was brought to its preſent perfection, by the induſtry and ſagacity of ingenious men.

[a] In Præfat. Lib. V. item Scribonius Largus, Cap. lxviii. [b] In Præfat. Lib. VII.
[c] In Præfat. Lib. I.

VII. By as much as we can collect from ancient Hiſtory, the *Chaldeans* and *Egyptians*, who were the firſt cultivators of Science, found *Surgery* naked and in her infancy, enriched her with new experiments, and laid her down rules and inſtitutions to walk by, and afterwards [a] *Surgery* was ſtill much farther enriched by the *Greeks*, thoſe ancient and noble patrons of knowledge. *Apollo* and his ſon *Æſculapius* were chiefly celebrated as Surgeons in thoſe ages, who, for their ſagacity in cultivating this Science, gained to themſelves ſo great applauſe, that they were reckoned among the number of the Gods. After theſe came *Podalirius* and *Machaon*, two ſons of *Æſculapius*, who accompanied *Agamemnon* to the *Trojan War*, and were of great ſervice to the Army. But *Homer* never takes notice of them as being ſerviceable in the Plague or other kinds of diſtempers, but only as Perſons ſkilful in healing Wounds by the application of Inſtruments and Medicines. From whence it appears that they were only expert in *Surgery*, and that it is the moſt ancient Branch of *Phyſic*. We read of *Chiron* the *Centaur*, and other *Surgeons* after them, who equalled them in reputation; but the monuments of thoſe days are long ago entirely defaced by time. *Hippocrates* the *Coan* ſeems to have far exceeded all the reſt in ſagacity and induſtry; *Celſus* declares of him, "that he was not only celebrated "for Wiſdom and Art, but for Eloquence alſo." He inherited *Surgery* by deſcent, being ſprung from the race of *Æſculapius*. With no leſs judgment than labour he formed a complete Syſtem of the Experiments and Rules of his Anceſtors, with their methods of Cure, and with the aſſiſtance and directions of *Democritus*, made a great progreſs in the ſtudy of [b] *Human Anatomy*. For which reaſon, they are by no means deceived who have pronounced *Hippocrates* the Father of all Branches of *Phyſic*, but more particularly of *Surgery*. The writings of this great Man, notwithſtanding they are the moſt ancient, ſo far exceed all the reſt, that at all times they have been laid down as examples to all *Profeſſors* of *Phyſic*.

Improvements of *Surgery* in *Greece*.

VIII. The *Greeks*, by the ſtrenuous application to the ſtudy of *Surgery*, excited a deſire in the *Romans*, and at the ſame time in the *Egyptians*, to give encouragement to the ſame Art. "[c] About this time, a little before the "birth of CHRIST, *Philoxenus* was eſteemed as a *Surgeon*, who, according to "*Celſus*, wrote ſeveral Volumes upon this branch of *Phyſic*. *Gorgonus* alſo and "*Soſtratus*, and *Herones*, and the two *Apollonius's*, and *Ammonius Alexan-*"*drinus*, and many other famous men, all enriched this *Science* with ſome "thing new. At *Rome* alſo, *ſaith the ſame Author*, there were Profeſſors of "great note, eſpecially *Tryphon* the Father, and *Euelpiſtus*, the Son of *Phle-*"*ges*, and, as we may gather from his writings, the principal of all, *Meges*; by "changing ſome things for the better, they added improvements to this *Sci-*"*ence*." But the writings of theſe men are all loſt. In the ages next after CHRIST, *Celſus* acquired the greateſt name amongſt the *Latin* Writers, (who we have often quoted) but among the *Greek* Writers, *Galen*, *Paulus Æginetа*, *Ætius*, and *Oribaſius*; whoſe works are ſtill extant. But after this, in the ſubſequent ages, the barbarous Nations began to over-run the whole Earth, and *Surgery* was ſo far from encreaſing, that it received the ſame fate with all other parts of Knowledge, and ſuffered under the common calamity. There-

Proficiency of the *Romans*, *Greeks*, and *Arabians* in *Surgery*.

[a] Vide Celſ. Lib. I. Præf. [b] *As* Celſus *teſtifies*, Lib. I. Præf. [c] *See* Celſus in Præf.

fore

fore it is no wonder that thoſe times produced no one to whom *Surgery* was indebted, if you except only *Raſes*, *Haly Abbas*, *Albucaſius*, and *Avicenna*, who, flouriſhed in *Arabia* about the XI^th^ or XII^th^ Century. It is to be obſerved though by the way, from *Guido de Cauliaco* [a], the *Phyſicians* at this time firſt refuſed to undertake the performance of any *manual Operation*.

Induſtry of Surgeons of a later date.

IX. In the XIII^th^ and XIV^th^ Centuries, when the clouds that had overſhadowed all Science began to diſpel, the ſtudy of *Surgery* alſo again began to be cultivated both by *Phyſicians* and *Surgeons*. There appeared at firſt BRUNUS, THEODORIUS, SALICETUS, LANFRANCUS, ARNOLDUS DE VILLA NOVA, and many others equally famous: but afterwards, in a ſtill more conſpicuous light, ſhone that true Reſtorer of *Surgery* GUIDO DE CAULIACO, DE LARGELATA, JO. DE VIGO, VESALIUS, FALLOPIUS, ANDREAS A CRUCE, ARCÆUS, MARIANUS SANCTUS, ANGELUS BOLOGNINUS, BERENGARIUS CARPUS, ALPHONSUS FERRIUS, JOANNES TAGOLTIUS, BARTHOLOMÆUS MAGGIUS, PARÆUS, SCHILLHANS, GERSTOFF, BRUNSVIC, RYTT, and others, who greatly added, as appears by their writings, to the improvement of *Surgery*.

Of the Moderns.

X. At length in the laſt and preſent age, by the induſtry firſt of the *Italians*, *French*, *Germans*, and more latterly alſo of the *Engliſh*, *Surgery* has been ſo wonderfully enriched with extraordinary inventions and obſervations in *Anatomy*, *Mechanics*, and *Phyſics*, and with elegant inſtruments and new methods of Curing, that it ſeems to want little or no addition to raiſe it to its higheſt ſtate of excellency and perfection. But although I purpoſed now to give a regular account of thoſe by whoſe labours *Surgery* has gained the fruits it at preſent enjoys, yet ſince the number of thoſe is ſo large, let it ſuffice for the preſent to reckon up the principal of them; leaving the enumeration of the reſt to another opportunity. In this rank we may reckon FABRICIUS AB AQUAPENDENTE, FABRICIUS, HILDANUS, M. A. SEVERINUS, SPIGELIUS, MARCHETTUS, GLANDORPIUS, JO. SCULTETUS, FELIX, WURTZIUS, GUILLEMAEU, CÆSAR MEGATUS, CASP. TALIACOTIUS, GOUSMETINUS, RONHUYSIUS, VAN MEEKEREN, CORN. SOLINGEN, NUCHIUS, BURMANNUS, MAURICIAU, TOLET, VERDUCCIUS, BIDLOUS, RUYSCHIUS, BOHNIUS, CYPRIANUS, RAUIUS, MASSIERUS, DIONIS, PETIT, WISEMAN, DOUGLAS, CHESELDEN, GARENGEOT, MARINUS, TURNER, MORAND, LE DRAN, and many others, whom you will find among the *Chirurgical* Writers.

Writers on particular parts of *Surgery*.

XI. Before we proceed farther, I think it will be of ſervice to the Students in Surgery, to inform them of the beſt Writers that have treated of particular parts of *Surgery*, and have either handled theſe ſeparately, or at leaſt with ſuperior ſucceſs: in deſcribing of theſe I ſhall obſerve, as near as I can, the ſame order in which this book is diſpoſed. And firſt, the following Authors have treated of *the five principal parts of Surgery*, to wit, *Wounds*, *Fractures*, *Luxations*, *Tumors*, and *Ulcers*; *Veſalius*, *Tagultius*, *Fabric. ab Aquapendente*, then *Corteſius*, *Reccetius*, *Wiſeman*, *Munnick*.

Authors on Wounds.

XII. The following Writers upon *Wounds* in general well merit reading, *Parœus*, *Arcæus*, *Fabricius ab Aquapendente*, *Glandorpius*, *Wagatus*, *Belloſtius*,

[a] *See his Chirurgical Works.*

Upon

Upon *Wounds of the Head* in particular; *Hippocrates*, *Celſus*, *Carpus*, *Arantius*, *Pevius*, *Millerus*, *Schultzius*, *Waltherus*, and *Robault*, a modern *Frenchman*: On *Diſeaſes of the Eyes*; *Fallopius*, *Jo. Langius* in *Ephemerid. N. C. Cent.* V. & VI. *St. Yves*: On *Wounds of the Breaſt*; *Fumanellus*, *Pechlinus*: On *Gunſhot Wounds*; *Plazzonus*, *Maggius*, *Ferrius*, *Rota*, *Paræus*, *Fallopius*, *Guillemeau*, *Hildanus*, *Botallus*, *Burmannus*, *Taſſin*, *Verduc*, *Vauguion*, *Charriere*: Of *Tents*, *Baietus*: Of the *Abuſe of Tents in Wounds*; *Magatus*, *Belloſtius*, and a late *French* piece of *Chabert*'s, and of *Lupus* in *Italian*: Uſeful *Obſervations on Wounds* have been publiſhed by *Belloſtius*, *Schwartzius*, *De la Motte*, *Chabert*, *Le Dran*: The beſt diſcourſes on *Mortal Wounds*, and the Method of diſcovering them to be ſo, have been written by *Bohnius*, *Teychmeyerus*, *Zacchias*, *Ammannus*, *Valentinus*, *Zitmannus*, *Frid. Hoffmannus*: To the ſame purpoſe is a book whoſe title is, *The Art of forming Prognoſtics in Surgery*, in *French*, and *Blegnius* upon the ſame ſubject.

XIII. On *Fractures* and *Luxations*; *Paræus*, *Aquapendens*, *Hildanus*, *Verduc*, in a particular volume on this ſubject; *Le Clerc* in his *Oſteology*; *Petit*'s *Art of curing the diſeaſes of the Bones*, in *French*; *Palfinus* in *Dutch*: On *Fractures of the Cranium*; *Hippocrates*, *Celſus*, *Carpus*, *Corteſius*, *Paaw*, and the Authors above recited, who have diſcourſed on Wounds of the Head. On Fractures and Luxations.

XIV. On *Tumors*; *Ingraſſius*, *Fallopius*, *Arantius*, *Saporta*, *M. A. Severinus*, *Schelhammer*, *Calvers*, *Maubec*, in *French*: On *Suppuration*; *Lazerme*: On *Abſceſſes*; *Severinus*: On the *Carbuncle and Peſtilential Bubo*; *Fallopius*, *Gemma*: On *Œdema and Schirrus*; *Harris*: On *Fungous Tumors of the Limbs*; *Slevogtius*: On *Gangrene and Sphacelus*; *Hildanus*, *Koenerding*, *Harris*: On *Burns*; *Hildanus*: On a *Cancer*; *Allio*, *Gendron*, *Helvetius*, *Harris*, and much earlier *Textor*: On *Ulcers*; *Fagaultius*, *Bononinus*, *Fallopius*, *Aquapendens*, *Verduc*, *Le Clerc*: On *Caries of the Bones*; *Petit*: On a *Spina Ventoſa*; *Severinus*, *Pandolphinus*, *Marchettus*, and *Walther*, in *High Dutch*. Of Tumors and Ulcers.

XV. The beſt authors on *Chirurgical Operations* in general, are *Celſus*, *Ægineta*, *Paræus*, *Fabr. ab Aquapendente*, *Solingens*, *Nuchius*, *Verduc*, *Vauguion*, *Chavrire*, *Dionis*, *Paſynus*, *Maſſierus*, *Garengeot*, *Marinus*. On Chirurgical Operations.

XVI. On *Bleeding* in particular, beſides many others, you will find *Botallus*, *P. P. Magnus*, *Schmid*, *Sondat*, *Verna*, *Mellius*, *Crone*, *Harris*: On the *Aneuriſm*; *Bartholin*, *Horn*, *Harris*: On *Infuſing Humors into the Blood*; *Major*, *Ettmuller*, *Elſholzius*: Of *Tranſfuſion*; *Lower*, *Sturmius Santinellus*, *Maſridus*, *Marklinus*, *Burmannus*. Of Bloodletting, and Operations of the like nature.

XVII. Of *Inoculation of the Small Pox*; *Maitland*, *Pilarinus*, *Le Duc*, *Vaterus*, *Wreden*, *Harris*: Of *Cupping and Scarifying*; *Celſus*, *Galen*, *Magnus*, *Botallus*, *Mannus*, *Mellus*: Of the *Abuſe of Cupping in Putrid Fevers*; *Aquapendens*: Of the *Egyptian Method of Scarifying*, *Alpinus*, *Stabilus*: Of *Leeches*; *Galen*, *Magnus*, *Heurnius*, *Stablius*: Of *Puncture with a needle after the manner of the Japoneſe*; *Rhyne*, and *Koempflerus* of *Iſſues*; *Galvanus*, in *Italian*; *Glandorpius*, *Reſtaurant*, and *Schoretus*, in *High Dutch*: Diſſertations on this ſubject have been written by *Albinus*, *Schelhammerus*, *Schoſcherus*, *Fr. Hoffmannus*, *Hilſcherus*, and others: On *Cantharides*; *Geyerus*, *Albinus*, *Wedelius*: On the *Uſe of Bliſters*; *Caius*, *Nenterus*, *Fr. Hoffmannus*, *Lætius a Fonte*, and *Herculas Saxonia*: On *Cauteries*; *Albucaſis*, *Carivaccius*, *Gavaſſetius*, *Severinus*, *Cortanus*, *Magnus*, *Fallopius*, *Fienius*, *Bartholinus*, *Bauhinus*, *Slevogtius*: On the method of Of Operations which are performed on various parts.

uſing

uſing the *Indian Moſs (Moxa)*; *Tan Rhynes*, *Cleyreus*, *Valentini*, *Le Temple*: Of *Atheromata* and *Steatomata*; *Corteſius*, *Jo. Langius*, *Elſholſtius*: Of the *Meliceris*; *Hildanus*, *Setizius*: Of *Encyſtated Tumors*; *Slevogtius*: Of *Extracting foreign Bodies from Wounds*; *Bidloo*: Of *Amputation of the Limbs*; *Fienus*, *Hildanus*, *Hoffmannus*, *Hilſcherus*: Of *a new Method of taking off Limbs*; *Jonge*, *Verduin*, *Ruyſchius*, *Koenerdingius*, *Salzmanneus*.

Operations on the Head. XVIII. Of *an Iſſue upon the Coronal Suture*; *Slevogtius*: Of *Arteriotomy*; *Fienus*, *Severinus*, *Alpinus*, *Scheurlius*: Of the *Hydrocephalus*; *Corteſius*: Of *Trepanning*, and particularly of the difficulties that attend that Operation; *Fienus*, *Bohnius*, *Coſchwitzius*.

On the Eyes. XIX. Of *Diſorders of the Eyes*; *Bartiſchius*, *Guillemeau*, *Read*, *Coward*, *Maitre Jean*, *Kennedy*, *St. Yves*: Of the *Trichiaſis*; *Heiſter*: *Of Scarification of the Eyes*; *Manchartus*, *Platnerus*: Of the *Fiſtula Lacrymalis*; *Arellus*, *Heiſter*, *Mellius*, in *Italian*, *Platnerus*: Of a *Cataract*; *Maitre Jean*, *Briſſeau*, *Wolhuſius*, *Heiſter*, *Widemannus*, *Marinus*: Of the *Hypopion*; *Bidlous*.

On the Noſe and Mouth. XX. Of a *Polypus of the Noſe*; *Glandorpius*: Of the *Hair Lip*; *Marinus*: Of *Diſorders of the Teeth*, and the Methods of remedying them; *Guillemeau*, *Strobelbergerus*, *Crone*, and *Frauchard*, a *Frenchman*, who lately wrote a Treatiſe called *Le Chirurgien Dentiſte*: Of the *Epulis* and *Paſulis*; *Schelhammerus*.

On the Neck and Breaſt. XXI. Of *Laryngotomy*; *Caſſerius*, *Moreau*, *Fienus*, *Dekkerus*, *Moravius*, *Fontanus*, *Maſſierus*: Of *Strumæ and Scrophulæ*; *Laurentius*, *Browne*, *Gibbs*: Of *Setons*; *Gulvanus*, *Jo. Francus*, *Wedelius*, *Melzgerus*: Of the *Cancer of the Breaſts*; ſee above under the Head, *Cancer*: Of *Gibboſity*; *Wedelius*.

On the Abdomen. XXII. Of a *Paracenteſis*; there are ſeveral academical Theſes extant upon this ſubject, by *Meribomius*, *Albinus*, *Slevogtius*, *Henningerus*: Of the *Cæſarean Birth*; *Roſſetus*, *Bauhinus*, *Deering*, *Hildanus*, *Beauleau*, *Raynandus*, *Fienus*, *Lankiſchius*, *Cyprianus*, *Herogtius*: Of *Herniæ*; *Petrus Franeus*, *Geigerus*, *Le Quin*, *Launay*, *Berenger*, *Vontamen*, *Widemannus*, *Harris*, *Houſtoun*, in *Engliſh*, *Jo. Sermes*, in his Book of *Lithotomy*, and divers academical Theſes; in particular upon the *Hernia incarcerata*, one by *Mauchart*; on the *Crural Hernia*, by *Kochius*; on the *Enterocele*, by *Rolfincius* and *Petermannus*; on the *Sarcocele*, by *Marinus*; on the *Hydrocele*, by the ſame; and on the *Abuſe of Kelotomy*; *Heiſter*.

On the Parts of Generation. XXIII. Of a *Phimoſis* and *Parophimoſis*; *Wedelius*: Of the *Cloſure of the natural Paſſages*; *Wierus*: Of *Imperforations*; *Wedelius*: Of *paſſing the Catheter*; *Meibomius*, *Marinus*: Of *a Stone in the Urethra*; *Marinus*: Of *a Caruncle in the Meatus Urinarius*; *Ferrius*, *Lacuna*, *Benevolus*: Of *Fiſtulæ in the Urethra*; *Hildanus*, *Marchettus*, *Beckerus*.

Of Lithotomy. XXIV. Of *Lithotomy, and particularly of what they call the great Apparatus*; *Marianus Sanctus*, *Hildanus*, *Toletus*, *Groenvelt*, *Alghiſius*, *Marinus*, *Callotus*: *Of the leſſer Apparatus*; formerly *Marinus*, who defends it in ſome particular caſes, though by others it is altogether laid aſide: Of *the High Apparatus*; *Petrus Francus*, *Roſſetus*, *Douglas*, *Cheſelden*, *Middleton*, *Morand*, *Jo. Sermes*, *Praebiſchius*, *and Heiſter*; Of *Frere Jacques's Method*; *Meryus*, *Liſterus*, *Dionis*: Of *Rau's Method*; *Albinus*, *Hertius*, and *Jac. Denyſius*: Of the *Lateral Operation*; *James Douglas*: Of *the different Methods of cutting for the Stone*; *Pye*, an *Engliſhman*, and *Le Dran*, a *Frenchman*, and *Schefferus*, and *Hertius*, in

in their Academical Theſes: Of *the Abuſe of Tents after Lithotomy*; *Hildanus*: Of *the Puncture of the Bladder in a Suppreſſion of Urine*; *Marinus*, *Meyerus*.

Of the Art of Midwifry.

XXV. Of *the Art of Midwifry*; among the Ancients, *Rupeus*, *Ruef*, *Rhodio*, *Paræus*: Among the Moderns; *Scipio Mercurius*, *Mauriceau*, *Peu*, *Portal*, *Virdel*, *Voelterus*, *Sigiſmunda*, a Midwife of *Brandenburg*, *Daventer*, *Dionis*, *Mellius*, *St. Amand*, *De la Motte*, *Hoorn*, *Suecus*: Of *the Method of extracting a dead Child*; *Hippocrates*, *Solingen*, *Fontanus*, and the Authors we have juſt recited: Of *the bearing down of the Womb*; *Beckius*.

Operations on the *Anus*.

XXVI. Of *Clyſters*; *Lanzonus*, *Swartzius*: Of *the Fiſtula of the Anus*; *Marchettus*, *Le Monnier*, *Gladbaccius*, *Baſſius*.

On the extreme Parts.

XXVII. Of *the Paronychia*; *Glandorpius*, *Wedelius*, *Albinus*: Of *the Suture of the Tendons*; *Kiſnerus*: Of *Clefts in the Feet*; *Wedelius*: Of *Ingrafting*; *Taliacotius*, *Sakmannus*.

Of Bandages.

XXVIII. Of *Bandages*; *Galen* tranſlated by *Vido Vidius*, with Figures; *Verduc* on Bandages in *French*, and *Solingen*; but the beſt Writers of all are *Le Clerc*, in his *Appareil Commode*, and *Baſſius* in *High Dutch*: On *Chirurgical Inſtruments* you may conſult *Oribaſius* and *Scultetus*.

Writers of Obſervations.

XXIX. Of *Obſervations in Surgery*; the beſt are related by *Paræus*, *Hildanus*, *Scultetus*, *Marchettus*, *Tulpius*, *Meckeren*, *Roonhuſius*, *Lambſwerdius*, *Ruyſchius*, *Belloſtus*, *Purmannus*, *Saviardus*, *De la Motte*, *Chabert*, *Le Dran*.

Miſcellaneous Writers.

XXX. Of *the principal Controverſies in Surgery*, conſult *Fienus*: On *the Duties of a Surgeon in the Army*, read *Franc. de Româ*, *Muraltus*, *Schmid*, *Taſſin*, *Purmannus*, *Belloſtius*, *Abeille*: Of *Surgery in the Time of a Plague*; *Purmannus*: Of *Chirurgical Anatomy*; *Gerga*, *Cheſelden*, *Palfinus*: Of *Midicines that are uſed in Surgery*; *Hollerius*, *Pigraeus*, *Wurtzius*, *Hildanus*, in his Tract *de Ciſtâ Militari*, *Ettmuller*, where he writes *de Chirurgiâ Medicâ*, *Le Clerc*, *Verduc de Faſciis*, and *Belloſt in Pharmaciâ Chirurgicâ*: *Chirurgical Inſtruments* are beſt deſcribed by *Albucaſis*, *Andr. a Cruce*, *Hildanus*, *Guillemeau*, *Fabr. ab Aquapendente*, *Scultetus*, *Solingen*, *Maſſierus*, *Dionis*, *Heiſter*, and *Garengeot*.

Knowledge of Languages neceſſary to a *Surgeon*.

XXXI. Since many of the moſt valuable Treatiſes in Surgery have been publiſhed in the Learned as well as in the Modern Languages, it will eaſily appear of what great Service it will be to the Surgeon, to be well verſed in thoſe Languages, eſpecially the *Latin* and *French*, ſince without this Aſſiſtance they will reap very little Advantage from the Inventions of others: but whoever is moderately verſed in the *Latin* Tongue, I would adviſe him to procure the Academical Theſes upon Chirurgical Subjects which are yearly publiſhed, for the Expence is trifling, and the Advantage that accrues from reading them, is by no means ſo; for they frequently contain many new and uſeful Obſervations, Deſcriptions of Inſtruments and Machines, and new Methods of Cure, that are not to be met with in larger Volumes.

Diviſion of *Surgery* into its Parts.

XXXII. Hitherto we have treated of the Nature, and End of *Surgery*, deſcribed the Aids that are neceſſary to it, and related the Fortunes it has met with in different Ages; Order therefore now requires us to proceed to its Diviſion, which is very different according to different Authors. There are many Profeſſors of *Surgery* who divide this Art into ſix Parts, and diſtinguiſh each of them with a *Greek* Name. Theſe are, 1. *Syntheſis*. 2. *Diæreſis*. 3. *Exæreſis*. 4. *Aphæreſis*. 5. *Proſtheſis*, and, 6. *Diorthoſis*. On the other hand, ſome divide it into five, ſome into four, ſome into three Parts, whilſt others aſſert that

it may be comprehended under two of theſe Diviſions. But ſince Perſons ignorant of the *Greek* Language are eaſily puzzled with *Greek* Terms, and beſides that the Diſtinctions are not juſt, as not comprehending all Parts of *Surgery*, it ſeems to be high time to aboliſh them, as we live in an Age more inquiſitive after Things than Words. Some, laſtly, have been fond of dividing *Surgery* into five Parts; the firſt treating of Wounds, the ſecond of Ulcers, the third of Fractures, the fourth of Luxations, the fifth of Tumors. Though even this Method of dividing by no means ſatisfies me, ſince the whole Art cannot be clearly explained, by ſpeaking to each of theſe Heads.

The Author's Diviſion of *Surgery*.

XXXIII. Wherefore, in my Judgment, it is beſt to divide *Surgery* into the three following Parts, by which means the whole Art may be laid down and taught with Clearneſs. The firſt, which is called *Pentateuch* by *Fabricius ab Aquapendente*, from the Number of Chapters it is compriſed in, treats of the Diſorders that are moſt common to the Human Body, and takes up five Books. 1. Of *Wounds*. 2. *Fractures*. 3. *Luxations*. 4. *Tumors*; and, 5. *Ulcers*. The ſecond Part treats of *Chirurgical Operations*, (as they are commonly called) deſcribing at the ſame time all ſuch Diſorders of the Human Body as are to be relieved by the Aſſiſtance of the Hand, and could not properly be deſcribed in the firſt Part. Laſtly, *Chirurgical Bandages* will be the Subject of the third Part, which we ſhall deſcribe in ſo clear a manner, that it will be very eaſy to learn not only how each of them is to be made, according to the Nature of the Diſeaſe or of the Limb, but alſo how they are to be applied, to the Benefit of the Patient; for though we find that *Surgeons* have paid very little Regard to the Deſcription of Bandages in their Writings, it is nevertheleſs not only extremely uſeful, but abſolutely neceſſary. Sometimes Accidents happen of ſuch a Nature, as Luxations, Fractures, Hæmorrhages, Herniæ, as only to admit of Help by Bandages, and where without ſuch Aſſiſtance the Cure would be extremely doubtful or deſperate; beſides this, by a neat and dexterous Application of a proper Bandage, the Surgeon not only gains the Admiration of the Standers by, but his Patient alſo puts more Faith in him, which very often forwards the Cure wonderfully.

The Author deſcribes the Method that he intends to follow in Writing.

XXXIV. Leſt any one ſhould be ignorant of the Method which I intend to obſerve in expounding the Chirurgical Doctrines which I am going to lay down, I ſhall give a brief Deſcription of it in this place. That thoſe who are deſirous of acquiring a thorough Knowledge of *Surgery* may not be diſappointed, I ſhall not, according to the Cuſtom of many others, content myſelf with ſolely deſcribing the Inſtruments and Machines that are made uſe of by Surgeons to relieve ſuffering Nature, neglecting at the ſame time the Hiſtory of Diſeaſes, and the Regulations that are to be obſerved with regard to Diet and Medicine, as if they were not Things neceſſary for the Surgeon to be acquainted with; but, on the contrary, I ſhall uſe the utmoſt Diligence, to explain, as clearly as it is poſſible, 1. The proper Nature and Diſpoſition of the Diſorder. 2. What Parts of the Body are liable to be affected by this or that Diſorder. 3. What the peculiar Symptoms of each Diſorder are, and how to form a proper Prognoſtic by them. 4. I ſhall deſcribe the principal Chirurgical Inſtruments which are beſt adapted to each Caſe, of which you will find Copper Plates, for the moſt part of the ſame Size with the Inſtruments which they repreſent. 5. I ſhall not only ſhew the beſt Method of performing all Operations in Surgery; but,

but, 6. In what manner the Patient is to be treated after the Operation, ſo as to recover his Health in the moſt ſpeedy, uſeful and pleaſant Manner; and this not only with regard to the Dreſſing and Bandages which are to be applied to the Part, but alſo with reſpect to the Medicines which are proper to be adminiſtred, and the Rules which are to be obſerved as to his Diet.

The Knowledge of Inſtruments is recommended, and a Supply of them promiſed.

XXXV. We declared above that a Surgeon's Hands would be of little Service to him, if he was not ſupplied with Variety of Inſtruments, which he ought to be very well inſtructed in, that ever hopes to arrive at a proper Uſe of them in the Cure of Diſeaſes. Therefore, that we may the more readily form our Surgeon, it will be well worth our While to treat briefly of the neceſſary Apparatus of Inſtruments which he is to be furniſhed with, before we are ſollicitous about teaching him the Manner in which they are to be uſed. I cannot deny but that there are a great Number of Chirurgical Inſtruments to be found in Chirurgical Authors; but, at the ſame Time, I can with Truth affirm, that many of them are obſolete and uſeleſs, and many of excellent Uſe have been omitted, (eſpecially at the time when I firſt publiſhed my Book of Surgery in the *German* Language, in the Year 1718) therefore it ſeems neceſſary to publiſh a Deſcription, not only of the moſt modern Chirurgical Inſtruments, but of thoſe beſt adapted to Uſe, keeping up to their proper Size as much as poſſible in the Plates; whether our Plates have ſatisfied this End or not, let others judge. This I am certain of, that I have made it my Study to ſave Students in Surgery the Labour of having recourſe to many Volumes, to ſearch after proper Inſtruments, and to exhibit to their View all the beſt and moſt uſeful Inſtruments in one Book; and in ſome places they will find Copies of Inſtruments which are not to be found in other Authors. *Garengeot* publiſhed a Book in *French* on Chirurgical Inſtruments, in which he exhibited many new and correct Inſtruments, but delineated in too ſmall a Size, which eaſily led Surgeons and Workmen, who endeavoured to imitate them, into Errors; the chief of theſe I have copied into this Book, and wherever my Page would admit of it, I have given you the true Dimenſions of the Inſtruments, in order to render them more uſeful. But as it is of much more Service to examine the Inſtruments themſelves than the Plates of them, therefore a Surgeon ought to neglect no Opportunities of examining and contemplating upon the beſt he can lay his Hands on, and eſpecially the neweſt invented. For my own Part, when I read Chirurgical Lectures, I always ſhew my Pupils all kinds of Inſtruments that are uſed in Surgery, and point out the Defects of the Ancients, and the Improvements of the Moderns.

Pocket Inſtruments deſcribed.

XXXVI. But in the firſt place, as they are more immediately neceſſary, and are in conſtant Uſe, I ſhall deſcribe the Inſtruments which a Surgeon ought always to carry about him in a proper Caſe, and are therefore called *Pocket Inſtruments*. To this Place belong thoſe Inſtruments in particular, which are deſcribed in Plate I. under the Letters A. and B. *two Lancets* of different Sizes. Theſe are uſed, eſpecially the ſmaller Sort, in opening Veins, for which Reaſon the *Greeks* called them *Phlebotoma*; but the larger Sort are uſed to open Abſceſſes with, and are therefore called by the *French Lancettes à l'Abces*. The Letter C. ſhews a Pair of *ſtrait Sciſſors*, fit for many Uſes; the Surgeon ſhould have ſeveral Pairs of theſe at home, of different Sizes. D. a Pair of *crooked Sciſſors*, proper to be uſed in dividing *Fiſtulæ*, and in many other Caſes. E. a Pair of *Forceps*,

furniſhed with Teeth at one End; theſe are uſed to remove Dreſſings, and ſometimes to extract Splinters or Thorns; they are alſo ſerviceable to the Surgeon in his Anatomical Exerciſes. *Forceps* of this kind are commonly made of Steel; but thoſe of Silver are much neater. F. a *Razor*. G. a *ſtrait Inciſion Knife*. H. a *crooked Inciſion Knife*. I. a *ſtrait double-edged Inciſion Knife*. K. a *Probe*, one End of which is broad and thin, for diſcovering a Fiſſure in the *Cranium*, and other Uſes; the other End is rounded, to examine the Depth and Situation of Wounds and Ulcers; for which Uſes alſo the Probe at Letter L. may ſerve. The neateſt Probes are made of Silver, tho' they are frequently alſo made of Steel, Ivory or Whalebone. M. a *grooved Probe* or *Director* to direct the Edge of the Knife or Sciſſors in opening *Sinus's* or *Fiſtulæ*, that by this Means the ſubjacent Veſſels, Nerves and Tendons may remain unhurt; the Ornament at the upper Part of it is for a Handle, though ſometimes that End is made in the Form of a Spoon, as you may ſee in the Figure at N. to contain a Powder to ſprinkle upon Wounds or Ulcers; ſometimes alſo it is forked at the End to divide the *Frænum* of the Tongue, as at the Letter O. At P. is deſcribed a *Spathula*. The Uſe of this Inſtrument is to depreſs the Tongue, in order to examine the State of the Tonſils, Uvula and Fauces, when they are affected with any Diſorders; it is alſo uſed to ſuſpend the Tongue, when the *Frænum* is to be divided: for which Purpoſe it has a Fiſſure at its Extremity, and ſhould therefore be rather made of Silver than of any other Metal. The following *Spathulæ* alſo at Q. and R. ſometimes reſemble this: Theſe are chiefly uſed in ſpreading Plaſters, Ointments and Cataplaſms; ſometimes with their ſulcated Extremity they are of Service in raiſing up fractured Bones of the *Cranium*. In this place alſo it will be proper to deſcribe different Sorts of *Needles*, *ſtrait and crooked*, for ſtitching up of Wounds, taking up of Arteries, and many other Uſes: I have given you crooked ones of different Sizes at the Letters S. T. V. X.

What Medicines a Surgeon ought to be furniſhed with.

XXXVII. What I have ſaid concerning the Inſtruments that are immediately neceſſary for a Surgeon to be provided with, is ſufficient; I ſhall proceed now to deſcribe other Things with which he is equally obliged to be furniſhed, as certain Medicines; ſuch as *Unguentum Digeſtivum commune*, *Unguentum Ægyptiacum*, *aut Fuſcum Wurtzii*; for cleanſing or digeſting foul Ulcers, and ſome vulnerary Balſam, as the *Linimentum Arcæi*, *Balſamum Samaritanum*, *Peruvianum*, *Capyvæ*, *de Mecha*, *&c.* To theſe muſt be added a Plaſter or two, as *Emplaſtrum Diapalmæ*, or *Stypticum Crollii*; ſince they will almoſt always be required. Neither ſhould a Surgeon ever be unfurniſhed with a Piece of *Vitriolum Romanum*, to take down luxuriant Fleſh, and ſtop Hæmorrhages; but if you are without Vitriol, its corroſive Intention will be anſwered by *Alumen uſtum*, *Mercurius præcipitatus ruber*, or *Lapis Infernalis*, or any other corroſive Medicine, which will alſo ſerve to make Iſſues or open Abſceſſes, or to perform any Work of that Kind. But the Surgeon ſhould always have in readineſs a certain Quantity of ſcrap'd Lint, that he may be able to give immediate Aſſiſtance to wounded Perſons; ſince, if he is unprepared, they may be eaſily taken off with an Hæmorrhage: which Circumſtance ought alſo to prevail ſtrongly with a Surgeon, never to be entirely unprovided with *Bandages*.

Neceſſary Qualifications for a Surgeon.

XXXVIII. Having already deſcribed the principal Inſtruments as well as Medicines with which the Surgeon muſt of neceſſity be provided, it remains to examine into the Qualifications that he ought to be Maſter of, to render him uſeful

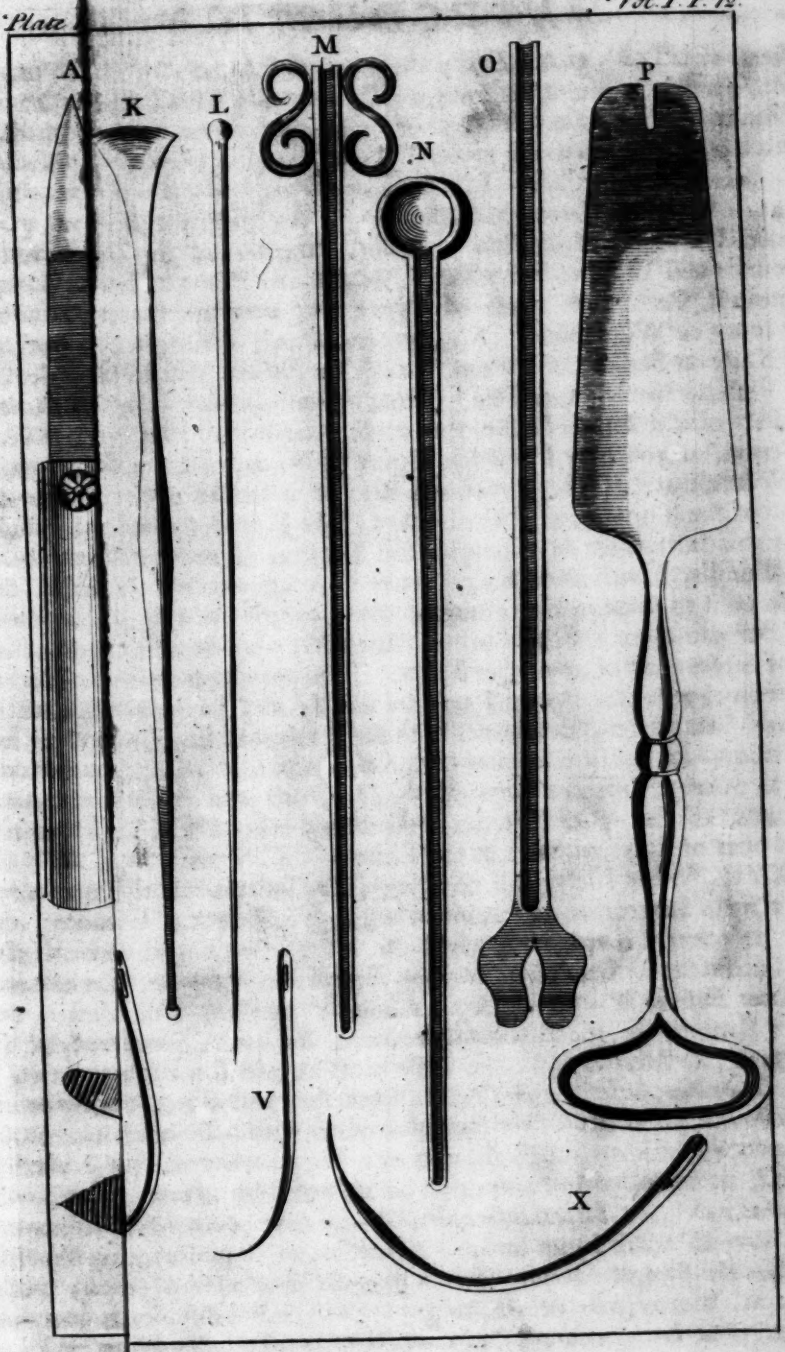
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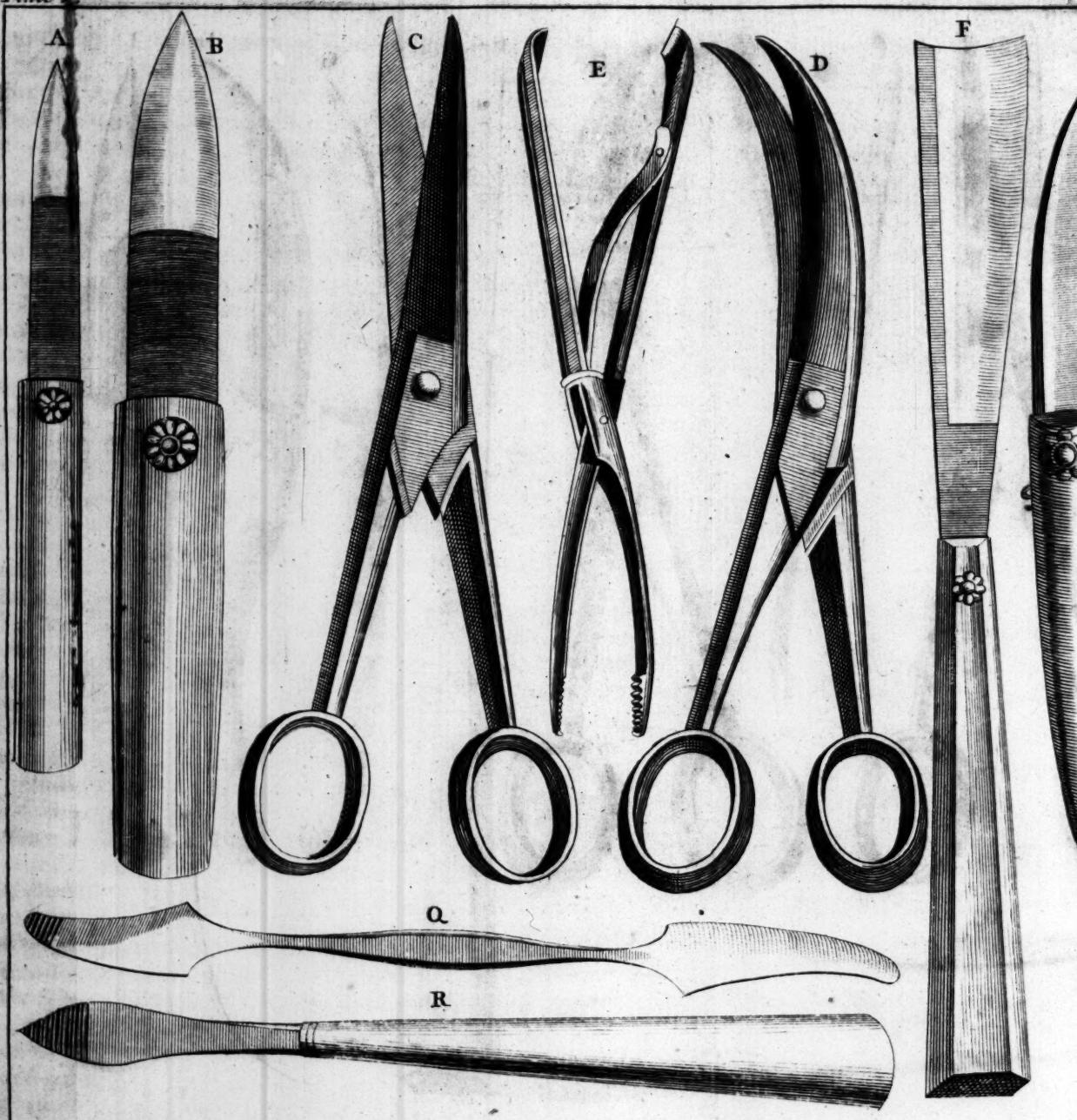
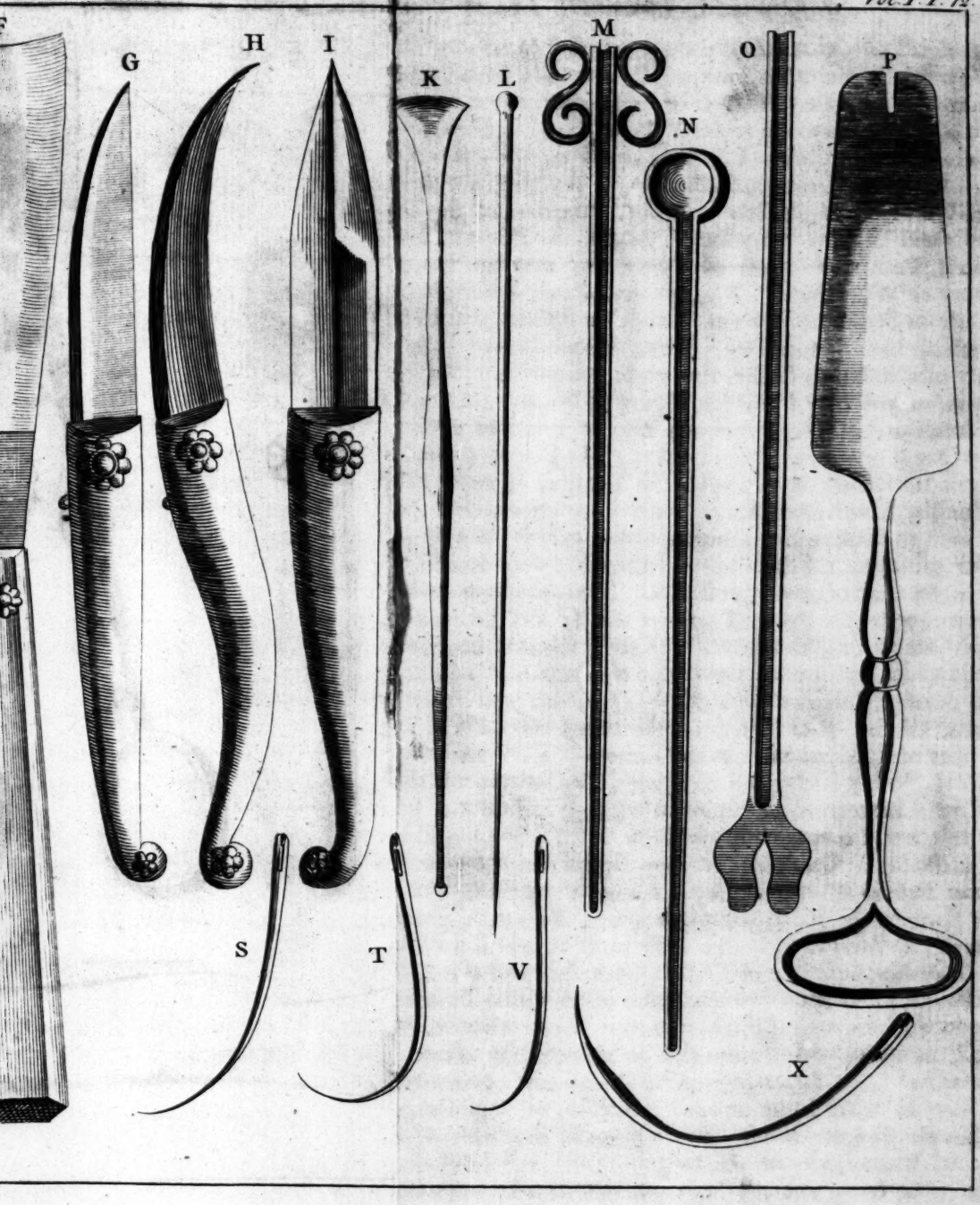
Plate I.

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uſeful in his Profeſſion. The Agility of Body, and Reſolution of Mind that are neceſſary to a Surgeon, are elegantly deſcribed by *Celſus*: "[a] A Surgeon, (ſays he) ought to be in his full Vigour, to have a ſtrong ſteddy Hand, never given to tremble, and to be as ready with his left Hand as his right; to have a quick, clear Sight, an intrepid Mind, void of all Tenderneſs, ſo as not to be at all moved by the Outcries of his Patient; to uſe no more Haſte than the Caſe requires, nor to cut leſs than is neceſſary; but he ſhould act in all reſpects as if he was entirely unaffected by his Patient's Complaints." But at the ſame time, I would have him behave with ſuch Caution as to be guilty of no Act of Raſhneſs or Cruelty, and very carefully avoid giving unneceſſary Pain. Agility of Body. Reſolution of Mind.

XXXIX. The two Qualifications that I have juſt recited, are by no means ſufficient of themſelves to render the Surgeon perfect; but there are others alſo which *Celſus* has paſſed over, which are highly uſeful and neceſſary. No one will excel in Surgery, unleſs he is firſt furniſhed with a good natural Genius, to which he muſt join a well-grounded Knowledge in Anatomy and Medicine; if he is furniſhed with theſe Gifts, he will not only with great Sagacity judge of the Cauſes and Circumſtances of the Diſorders upon which he is conſulted, but will with great readineſs make uſe of the beſt Methods, both with regard to the Adminiſtration of Medicines, and Application of proper Inſtruments for their Relief; whilſt, on the contrary, they who are not Maſters of theſe Qualifications, will daily be guilty of Capital Errors. Skill in Phyſic and Anatomy.

XL. Being poſſeſſed of theſe Foundations for Surgery, a proper Attendance upon the Lectures of Profeſſors, and a due Diligence in reading Chirurgical Authors ſhould be added. Therefore Perſons deſirous of a thorough Knowledge in Surgery, are not ſatisfied with viſiting Caſes that may accidentally occur to them in their private Practice, but diligently frequent all the Hoſpitals they can get Admittance to: And by this Means they ſee more in one Year, than they could otherwiſe do perhaps in the whole Courſe of their Lives; but in order to make the greater Proficiency in theſe Schools of Surgery, it will be worth While to diſtingniſh the different Kinds of Diſorders that fall under your Inſpection, after what Method, and with what Succeſs they are treated by Maſters of the greateſt Experience. Being prepared by repeated Obſervations of this kind, aſſiſted by the Advice of Maſters, you may at length try your Hand, at firſt upon dead Bodies, and afterwards, when you have Opportunity, upon diſeaſed Perſons; for this trite Saying will always have its Force: *The Artiſt is not made by Reading, Meditating or Diſputing, but by Practice.* Frequent Exerciſe in Hoſpitals.

XLI. Laſtly, that the Surgeon may not appear diſagreeable or terrible to his Patients, eſpecially if they are Perſons of Diſtinction or Quality, he ſhould diligently avoid the Appearance of Roughneſs in his Behaviour, or Naſtineſs in his Dreſs: For good Breeding and Cleanlineſs have their proper Effect in all Parts of Life; but the Surgeon gains a particular Confidence with his Patient by his Addreſs, which has no ſmall Share in the Succeſs of his Endeavours. Good Manners and Cleanlineſs.

XLII. The Surgeon being endued with theſe Principles and Qualifications, may proceed to the Practice of his Profeſſion; but that he may ſucceed the better in the Execution of it, it is proper he ſhould be acquainted with what is his Duty in every Step of it. As ſoon as ever he is introduced to his Patient, he The Surgeon's Duties to his Patient.

[a] Vid. Lib. VII. Præfat.

ought

First he is to examine the Caſe.

ought in the firſt place, (as *Hippocrates* well adviſes) to enquire of him or his Friends what ails him? where is the Seat of his Complaint? from what Cauſe it proceeds? and how long it has been upon him? If there is no particular Objection, he ſhould examine the Part himſelf, and diligently weigh all that he has heard or ſeen that may give him any Light into the Caſe, that he may come at a thorough Knowledge of the Nature of the Diſorder.

Whether curable or not, and by what Means.

XLIII. Having finiſhed his Examination, the next Thing to be done is, to conſider under what Claſs of Diſorders it is to be ranked, and whether it be curable or not? if it is deemed curable, whether it will be a Caſe of Time and Difficulty, or not? whether it is curable by Medicines alone? or whether the Aſſiſtance of the Knife be neceſſary? for the ſafeſt and moſt gentle Methods muſt always be preferred to harſh and dangerous ones, and are always to be tried firſt; but to Diſorders of a violent Nature, dangerous and even doubtful Remedies are to be tried. They are to be highly condemned therefore, who, after the Methods of [a] Mountebanks, condemn their Patients who labour under *Herniæ*, without Regard to Age or Habit of Body, to the Operation of the Knife, when far the greater Part of them might be cured by a ſafer and eaſier Method. But if you ſhall find it impoſſible to ſave your Patient by gentle Methods, you ſhould declare the Danger to the Patient, or rather to thoſe about him, leſt, if the Diſorder ſhould get the better of your Art, you ſhould be ſuſpected of being ignorant, or of having had an Intention to play the Rogue.

He ſhould undertake the Cure with great Circumſpection.

XLIV. If the Surgeon ſhall find the Diſorder to be curable, but to be of ſuch a Nature as to require the Knife, he ſhould declare this in due Time to the Patient, and ſhould have his Approbation or Conſent before he undertakes it; for a Surgeon is not only to take care to ſtop the Fury of the Diſeaſe, and leſſen the preſent Pain, but alſo to provide againſt Accidents that may happen by Delay; ſuch as may chance to render the Caſe incurable. In very difficult Caſes, the Surgeon not only provides for his Patient's Good, but his own, if he calls in other Phyſicians and Surgeons, with whom he may conſult before he proceeds to any Operation; for by this means he will ſave himſelf from all Blame of having proceeded raſhly or ignorantly, eſpecially when he is concerned for Perſons of Diſtinction, if Things ſhould go otherwiſe than he could wiſh.

He ſhould be furniſhed with proper Inſtruments before he begins.

XLV. Having proceeded ſo far, with the Cautions that I have adviſed, every Thing ſhould now be carefully provided which is neceſſary for Inciſion, Dreſſing, or any other Action, before the Operation be entered upon; but this Apparatus of Inſtruments and Dreſſings ſhould never be got ready in your Patient's Chamber, or in his Sight, leſt they ſhould ſtrike him with a ſudden Fear, and bring on fainting Fits and other Accidents, which would very much diſturb the Operation. For the ſame Reaſon a Croud of uſeleſs Spectators ſhould never be admitted into the Room, becauſe, beſides the Diſturbance that they create to the Patient, it is to be feared they will very much annoy the Operator, by intercepting the Light, and filling up the Room: Beſides, ſhould any one

[a] I ſaw an Inſtance of this in a Mountebank, who undertook the Cure of a Boy of about ſix Years of Age, for a *Hernia*, and not only performed the Operation, but caſtrated him: When I aſked him in private, Why he uſed this hazardous Method without trying a Truſs, ſince his tender Age would eaſily have admitted of it; he ingenuouſly confeſſed, he did it for Profit; for he would have been paid but a Crown for the Truſs, whereas the Operation brought him ten, if not twenty.

rudely

rudely preſs upon him, whilſt he is performing any nice Operation, it might be of the utmoſt ill Conſequence.

He ſhould encourage his Patient.

XLVI. When the Surgeon is entering upon the Operation, he ought to uſe his utmoſt Endeavours to encourage the Patient, by promiſing him in the ſofteſt Terms to treat him tenderly, and to finiſh with the utmoſt Expedition; and indeed he ſhould uſe Expedition, but not Hurry; and ſhould be very careful to give no unneceſſary Pain, but, at the ſame time to leave no Miſchief unremedied; if he obſerves theſe Rules, he will be ſure to gain Credit with the Standers by.

After the Operation, the Wound is to be dreſſed.

XLVII. The Operation being now over, the Surgeon is to conſider what remains to be done; the Hæmorrhage occaſioned by it is to be ſtopped, the Wound to be dreſſed, the wounded Part is to be placed in the moſt convenient and eaſy Situation; and it is now Time not only to think of preventing any new Diſorder falling upon the Part, but to uſe all Endeavours for reſtoring Health itſelf.

Proper Diet is to be adviſed.

XLVIII. It is the Surgeon's Duty now to conſider of a proper Regimen for his Patient's Diet, to find out a convenient Chamber for him in a healthy Air, to encourage him to Reſt, and to avoid all Paſſions, and Reflections upon any Things that may diſturb his Mind; and, if any more Cutting is neceſſary, he ſhould be adviſed readily to ſubmit to it. Every Thing ſhould be carefully avoided that may ruffle the Patient, for Diſturbances of the Mind are great Enemies to the Health of the Body.

Impertinent Viſits ſhould be prevented.

XLIX. Frequent and impertinent Viſits to the Sick, from his Friends or others, ſhould be carefully prevented; for they will undoubtedly fatigue and diſturb him: But we do not mean by this to cut him off from all Converſe with Mankind, a little chearful Company now and then would rather give him Eaſe, and make him forget his Pains; but I had much rather he ſhould divert himſelf by attending to others, than by ſpeaking himſelf.

Great Caution is to be uſed in prognoſticating.

L. *Celſus* declared Phyſic to be a conjectural Art; theſe Conjectures therefore muſt be made with the utmoſt Caution, and the Surgeon alſo ſhould uſe the ſame Caution in delivering his Prognoſtic, when he is called upon, and not, like bold Quacks, promiſe all will go well, whether the Caſe is curable or not. For ſhould the Caſe turn out contrary to your Prognoſtic, you will either be accuſed of Knavery or Folly: So if we liſten to Reaſon and [a] *Celſus*, it is the Part of a Mountebank to aggrandize a ſmall Performance: An honeſt Surgeon will always be very careful to avoid both Extremes; it is the Part of a prudent Man to declare from his Conſcience what he takes to be the true State of his Patient's Caſe; whether he believes it to be curable or incurable: In doubtful Caſes, where there is Reaſon for great Fear, but not for certain Deſpair, he ſhould declare his Reaſons both for Hope and Fear; but where the Caſe is extremely dangerous, he ſhould do it to the Relations. Sometimes it is better not to be concerned with a Patient, when it is impoſſible to be of any Service to him, leſt you ſhould be ſaid to have killed him, who died by his Diſeaſe [b]: But where you are concerned, let the Caſe be ever ſo deſperate, it is always the Duty of a prudent Surgeon, to cheriſh the Patient with ſweet Words, and give him Hopes of his Recovery; for ſome Diſorders are very much aggravated by Fear;

[a] Lib. V. Cap. 26. [b] Ibidem.

whereas

whereas the Expectation of Health and Eaſe is always ſo comfortable, that tho' it will not cure a Diſeaſe, it will at leaſt make it eaſier to be born.

The Senſes, and proper Inſtruments, of Service in examining Diſorders.

LI. We have already declared what are the principal Duties of a Surgeon; but ſince the *Firſt*, which is ſtrictly to examine the Caſe, and the *Sixth*, which concerns the Dreſſing of the Wound, are more immediately neceſſary, I ſhall more largely explain what Methods are to be obſerved both in examining and dreſſing Wounds. In examining and diſcovering dangerous and difficult Diſorders, the Surgeon requires many Aſſiſtances, as firſt his *Eyes* are neceſſary to him, by the Uſe of which he will diſtinguiſh Wounds, Ulcers, Tumors, Fractures, Cataracts, and a thouſand other Diſorders; but if the Caſe is of ſuch a Nature that it eſcapes the Sight, or is not wholly diſcoverable by it, the Hands are to be called in Aid. This happens frequently in Fractures, Luxations, Abſceſſes, Herniæ, *&c.* *Inſtruments* alſo are ſometimes required in this Place, eſpecially *Probes*, in diſcovering the Situation of Wounds, Ulcers, Fiſtulæ, Fractures of the Skull, and the like Diſorders. The *Ears* alſo are required to give their Report of ſome Diſorders; Fractures of the Bones are frequently diſcovered by the Noiſe which their Extremities make when they are rubbed together; the Senſe of Hearing is of ſo eminent Service in diſcovering of Stones in the Bladder, that, unleſs the Extremity of the Catheter is heard to ſtrike againſt the Stone, we are never ſufficiently juſtified in determining a Stone to be there. Some Diſorders are diſcovered by the *Smell:* By the Benefit of this Senſe we diſcover the State of Malignity of an Ulcer, and in difficult Births, the *Fœtus* is diſcovered to be dead by the great Stench that proceeds from the Womb; and this is the only Method we have of being certain in this Caſe; we are aſſiſted alſo by this Senſe in acquiring an eaſier Knowledge of a Caries of the Bones, an ulcerated Cancer, and Diſorders of this Sort, which carry with them a peculiar Smell.

And Reaſon itſelf.

LII. But Caſes in Surgery frequently happen, where the external Senſes aſſiſted by Inſtruments will by no Means yield ſufficient Light to their Diſcovery; but *Reaſon* and *Judgment* are alſo required, the true Nature of a Diſeaſe is diſcovered by reaſoning upon its various Symptoms. *Hippocrates*, the common Parent of Phyſic, ſeems to have regarded this, when he ſaid, [a] Whatever eſcapes the Reach of our external Sight, ſhould be ſearched for and overtaken by the Eyes of the Mind. So when any one has had a violent *Concuſſion of the Brain*, from a Fall or a Blow, without receiving any external Hurt, he will lay ſenſeleſs, as if he were in a profound Sleep; Reaſon in this Caſe will eaſily inform us, that there is an Extravaſation of Blood in the Cavity of the Cranium, and that proper Methods muſt inſtantly be uſed to make a Paſſage for it externally. Our Reaſon is of equal Service of us in an *Empyema:* For tho' in this Caſe Matter is formed in the Cavity of the Thorax, from a previous Inflammation of ſome of its Contents, yet we ſhall meet with great Difficulty in diſcovering this to be the Caſe, by our external Senſes; but by comparing the preſent Symptoms with the Diſorder that was previous to them, we find it neceſſary to treat the Caſe as an *Empyema*; and of this Kind there are many Inſtances.

Of the neceſſary Apparatus for Dreſſings.

LIII. We are next to treat of what principally belongs to the Method of dreſſing the diſordered Parts. In this Place we are firſt to ſpeak of [b] *Lint*, which is the Scrapings of fine Linen; this may be made into various Forms, which acquire

[a] In Lib. de Arte. [b] *Celſus*, Lib. V. Cap. 26——Num. 21.

a

a different Name, according to the difference of their Figure; thoſe that approach neareſt to an oval or orbicular Form are called *Pledgits*, ſee *Table* II. *Letters* A *and* B. Lint made into a Cylindrical Form, or reſembling the Shape of Dates or Olive Stones is called a *Doſſil*; their ſize is very different, as appears *from the Figures at* CDE. Sometimes they are ſecured by a Thread tied round their Middle, as it is expreſſed *by the Figures at the Letters* FG. It requires a good deal of Time and Experience, to acquire a proper Expertneſs in making up theſe Forms.

LIV. Theſe different Forms of ſcraped Lint are required for many Purpoſes; for they are apply'd, 1ſt, *To ſtop Blood in freſh Wounds*, by filling them up with dry Lint before you apply the Bandage; but if you have not ſcraped Lint at hand, you may tear a fine piece of Linen into ſmall Rags, and apply it in the ſame manner, and perhaps with a better Effect; but in very large Hæmorrhages they ſhould firſt be dipt in ſome Styptic Liquor, Alcohol, or Oil of Turpentine; or ſprinkled with a Styptic Powder; but of this we ſhall preſently treat more largely. 2dly, *To agglutinate and heal Wounds*, To which end ſcraped Lint is very ſerviceable; if it is ſpread with ſome digeſtive Ointment or Balſam, or dipt in ſome vulnerary Liquor, they alſo yield us great Aſſiſtance. 3dly, *In drying up Wounds and Ulcers*, and forwarding the Formation of the Cicatrix. They are uſed alſo with Succeſs, 4thly, *In keeping the Lips of Wounds at a proper Diſtance*, that they may not haſtily unite, before the Bottom is well digeſted and healed. 5thly, and laſtly, They are highly neceſſary *to preſerve Wounds from the Injuries of the Air*. The ſmall portions of Lint that are tied round with a Thread, (*See Tab.* II. *Letters* F *and* G) are chiefly uſed in dreſſing Wounds and Ulcers, that are of the deeper kind, and are always applied to the bottom of ſuch Wounds, the remaining Cavity being fill'd up with other portions of Lint, not ſupplied with a Thread: And by this means we do not only provide for the immediate Removal of theſe Dreſſings, when we ſhall think it neceſſary, but, at the ſame time, prevent a poſſibility of leaving any Part of them concealed in the Bottom of the Wound. In very large Wounds, and eſpecially in Amputations of the larger Limbs, which Operations are frequently required in the Army and Navy at times when Lint is very ſcarce, it will be ſufficient to dreſs the bare Bone and Face of the Wound with ſcraped Lint, filling up the Cavity with *Tow*, covering all with a large *Compreſs*; Figures of which you will ſee at the *Letters* H *and* I. *Plate* II. The Surgeons in former Ages formed Compreſſes of Sponge, Feathers, Wool or Cotton, Linen being a ſcarce Commodity with them; but Lint is far preferable to all theſe, and is at preſent univerſally uſed.

Uſes of ſcraped Lint.

LV. Beſides the different Forms of Lint that we have deſcribed, there remains another, which is ſometimes uſed in dreſſing of Wounds, called *Tents*, made of Lint worked into the ſhape of a Nail, with a broad flat Head; they differ in Thickneſs and Length according to the ſize of the Wound for which they are intended, as appears by the Figures *in Plate* II. *at the Letters* KLMN. Theſe Tents are chiefly uſed in deep Wounds and Ulcers. They are of Service, 1. Not only in conveying Medicines to the moſt intimate Receſſes and Sinuſes of the Wound; but, 2. To prevent the Lips of the Wound from uniting before it is healed from the bottom; to which we may add, 3. That by their Aſſiſtance grumous Blood, *Sordes*, &c. are readily evacuated. They are to be made extremely ſoft, that the Cure of the Wound may not be retarded by the Pain they

Of Tents compoſed of Lint.

would otherwiſe bring on; but that the Wound may not be kept open too long, I would adviſe the Surgeon, as ſoon as he has cleanſed the Part ſufficiently, and finds the Sinuſes heal up, to leſſen the ſize of his Tents by degrees, and as ſoon as he can conveniently, entirely to lay them aſide. I am not at all ſurprized, that many Surgeons of good name, (amongſt which are *Cæſar Magatus*, *Belloſte*, and others) have entirely forbid the uſe of Tents; ſince, to be ſure, it proceeded from a total neglect of this Caution in their uſe, amongſt too many of their brethren.

Of Tents made of Linen Rags.

LVI. But there is another kind of Tents, differing from that which we juſt now deſcribed, made of Linen Rags, not ſcraped, worked up into a Conical Form, to the Baſis of which is faſtened a long Thread; the Apex of it muſt be a little unravelled to make it ſofter, that it may not become painful. The Thread is faſtened to the Baſis that it may be recovered with the greater eaſe, if by any Accident it ſhould be forced into the Cavity of the Thorax or Abdomen; (*See Plate* II. *Fig.* O.) for it is to be obſerved here, that the Tents we now deſcribe, are chiefly uſed to keep open Wounds that penetrate into the Cavity of the Thorax or Abdomen, in order to make way for the proper Diſcharge of Blood, Matter, *&c.*

Of Spongy Tents.

LVII. A third ſort of Tents remains to be deſcribed, whoſe principal office is, not only to keep open, but to enlarge by degrees the mouth of any Wound or Ulcer, which ſhall be thought too ſtrait, that by this means a freer Paſſage may be procured for the Blood and Matter that were confined, and that proper Medicines may find a more ready Admittance. Theſe Tents are made either of *Sponge* prepared in a certain manner, or of dried *Roots of Gentian*, *Calamus Aromaticus*, *&c.* for theſe kind of things imbibe the Matter that flows to them, and being preſently enlarged, dilate the Lips of the Wound. Not much unlike Tents, are the ſmall *Silver* or *Leaden Tubes*, which are frequently uſed to draw off Blood, Matter, or Water from the different parts of the Body: They are made of all ſizes and ſhapes, as you may ſee in *Plate* II. *at the Letters* P Q R S T V X. What farther concerns the uſe of theſe Tubes, you will ſee more largely treated of, when we ſhall deſcribe the Diſorders that more immediately call for their Aſſiſtance.

Of Plaſters.

LVIII. Your Apparatus for Dreſſings will be very deficient, if you are not furniſhed with *Plaſters*: The meaning of the Term is ſo well known, that I ſhould appear ridiculous if I went about to explain it; but there are different kinds of Plaſters without number; the principal of theſe, and the manner of making them may be learnt from various Books, as *in Auguſtanâ*, *Londinenſi*, *Boruſſo-Brandenburgicâ*, *Lemeriique Pharmacopœis*. Theſe Plaſters are ſpread upon Linen or Leather, according to the different circumſtances of the Wound, Place or Patient. If the Part upon which the Plaſter is to be laid is naturally hairy, it muſt be ſhaved; but that it may ſtick the better, the natural ſhape of the Part muſt be conſulted, and the Plaſter formed accordingly: Therefore ſome Plaſters aſſume a Round, Square, Triangular, Elliptical, or Lunar Form, others the ſhape of the Letter T, *&c.* as will clearly appear at Plate II. Number 1, 2, 3, 4, 5, 6, 7, 8. others there are which are divided at one or both ends, *See Number* 9, *and* 10. To theſe we may add thoſe kind of Plaſters which are perforated in the Middle, which are of frequent uſe in Fractures attended with a Wound; for by this Contrivance the Wound may be cleanſed and dreſſed without removing the Plaſter, *See Number* 11. But as theſe Plaſters are of very different Forms,

I have given you three Examples, though the ſquare and the round are moſt frequently in uſe; for, to ſay truth, there is hardly any Part of the Body, but what will admit of one of theſe Forms, eſpecially if the edges of the Plaſter are properly notched here and there with the Sciſſors.

LIX. The *Size*, as well as Form of Plaſters, is very various, ſince it muſt always correſpond with the Part which is bruiſed or wounded. Their *Uſe* alſo is no leſs various; for they are not only ſerviceable in ſecuring the Dreſſings, but they alſo forward the Maturation of the *Pus*, agglutinate and heal Wounds, unite broken Bones, heal Burns, aſſwage Pain; and, laſtly, ſtrengthen weak Parts. The Size and Uſe of Plaſters.

LX. It is frequently the Cuſtom, after the Plaſter and other Dreſſings are applied, to cover all with a *Compreſs*, which is made of the ſofteſt old Linen, four, ſix, or eight times doubled; theſe are of ſervice, not only by preſerving the Parts from the Injuries of the external Air, but alſo for the better ſecuring and fixing the Plaſters and other Dreſſings. Compreſſes are alſo frequently applied, where no Plaſter is made uſe of, and that, ſometimes dry, ſometimes wetted with certain Liquors, which are ſuppoſed to be ſtrengthening, reſolving, lenient, emollient, cooling; they are frequently dipped in Decoctions of certain Herbs, into Wine, Spirit of Wine, Water, Vinegar, or Oxycrate, and ſometimes into Lime Water; and theſe are either adminiſtred cold or hot, as the Circumſtances of the Caſe ſhall require. Of Compreſſes.

LXI. When you come to enquire after the *Figure* and *Size* of *Compreſſes*, you will find as great variety as you did amongſt Plaſters; many of them are *Square*, (*See Plate* II. *N.* 12.) others are *Oblong*, (*N.* 13.) again, others *Triangular*, (*N.* 14.) others reſemble the Form of a *Croſs*, (*N.* 15.) According to their Situation, ſome are called *Strait*, others *Oblique*, others *Tranſverſe*, others *Annular*, as if they ſurround the Arm, or Foot. There are others again in the form of an *Aſteriſm*, (*N.* 16.) ſome are divided either on one or on both Sides, as far as the Middle, (*N.* 17, 18.) ſometimes they form a *Hexagon*, (*N.* 19.) or are *Round*, or *Globular*, reſembling a Ball: Theſe are uſed in Luxations of the *Os Humeri*, and are placed under the *Axillæ*, (*N.* 20.) Sometimes Compreſſes of a much ſmaller Size are required, which are either *Square*, (*N.* 21.) and are uſed in Wounds of the Blood-veſſels, to reſtrain Hæmorrhages; or *Taper*, (*N.* 22.) when they are called for in Sutures of Wounds, or in Ligatures of the Arteries. The Shape and Size of Compreſſes.

LXII. Compreſſes of all kinds are intended for theſe Purpoſes: 1. To preſerve and cheriſh the natural Heat of the Body. 2. To ſecure the Dreſſings that lay under them. 3. To convey liquid Remedies to Parts wounded, or otherwiſe diſordered, and to prolong the uſe of them. 4. To fill up any Cavities or Depreſſions of the Parts, that the Dreſſings (eſpecially in Fractures) may be applied with greater Security. And laſtly, 5. to prevent Bandages from bringing on a troubleſome Itching, or other pain or uneaſineſs upon the Skin. Uſe of Compreſſes.

LXIII. But it is now high time to ſpeak of *Bandages*, ſince they are ſo neceſſary a part of the *Apparatus* in dreſſing and binding up of Wounds. They are not only of greater Service than Compreſſes and Plaſters in ſecuring the other Dreſſings, but are alſo of excellent uſe in reſtraining dangerous Hæmorrhages, and in joining fractured or diſlocated Bones. Though I have ſet aſide the third and laſt part of this Work purely for the Deſcription of Bandages, where you will find them more fully and accurately treated, I thought it nevertheleſs neceſſary to Of Bandages.

touch ſlightly theſe things that are principally neceſſary to a Surgeon, by way of Introduction.

Of what Materials they are to be formed.

LXIV. Almoſt all Bandages, that are uſed in Dreſſings of Wounds, Ulcers, fractured or diſlocated Bones, ſhould be made of clean Linen Cloth, ſoftened by Wearing, but ſtrong. They ſhould be of a proper Length and Breadth, and that it may be the ſtronger, examine the Courſe of the Threads, and tear the Cloth lengthways; Darns, Seams, and large Hems in the Linen ſhould be avoided as much as poſſible, that no Inconvenience may be brought on by the Roughneſs and Irregularity of the Rowler. The proper Size of Bandages we ſhall deſcribe more fully below.

Some Sorts of Bandages deſcribed.

LXV. There are different Sorts of *Bandages* for different uſes. Some are *common*, others *proper*; theſe are only applied to particular Parts, thoſe may be applied to any Part. So we may diſtinguiſh them into *ſimple* and *compound*, the *ſimple* are thoſe that are formed of one entire piece of Linen, the *compound* of ſeveral Pieces of Linen ſewed together in different manners. The moſt ſimple of all is not rolled up, and is the Bandage uſed in Phlebotomy, *See Lett. a. Plate* II. That at *Lett. b.* ſeems next to this, which is rolled up at one end, and is from thence called the *ſingle-headed Bandage*, as thoſe are called *double-headed* which are rolled up at both ends, *See Plate* II. *Letter c.* Next to theſe come other Bandages which are made out of one Piece of Linen, but divided at both ends almoſt as far as the middle, *See Plate* II. *Let. d.* Theſe are called by the Surgeons *four-headed Bandages.* The Bandage at *Letter e* is ſomewhat ſhorter and narrower, and is divided at one end, and perforated at the other: This is generally uſed in Dreſſings that are applied to the Penis, or one of the Fingers. The *Letter f* deſcribes a double-headed Bandage, divided about the middle, which is called the *uniting Bandage* from its uſe: For it ſerves to unite Wounds that are made lengthways, without calling for the Suture, which (as appears at *Letter g*) is provided in the middle with an opening through which the Head may eaſily be paſſed, the extreme parts of the Bandage hanging one over the Breaſt, the other over the Back. The chief uſe of this Bandage conſiſts in this, that in dreſſing Wounds of the *Thorax* or *Abdomen*, it is capable of ſupporting another Bandage that is ſomething wider, made of a Cloth four or ſix times doubled, and bound round the Breaſt or Belly; as will appear more clearly from what you will read below.

Of the T Bandage of *Heliodorus.*

LXVI. There remains ſtill to be deſcribed a compound Bandage, made of two Pieces of Cloth, almoſt in the form of the Letter T. as you ſee it is deſcribed at *Letter h*; its upper part is brought round the Belly and faſtened by a Knot, but the lower part paſſes under the Body between the Thighs, and being brought up again, is faſtened to the upper part upon the Back. Theſe Bandages plainly appear to be deſigned for the Security of ſuch Dreſſings as ſhall be thought proper to be applied to the *Anus*, or *Parts of Generation.* Some, from the Inventor, call it *Heliodorus's Bandage*; from its Shape it is called the T *Bandage*, and ſometimes from the Diviſion that is frequently made in the lower part of it, it is called the *double* T.

The Explanation of the Second Plate, *which exhibits thoſe things which are principally required in Dreſſings, taken chiefly from* Dionis.

A and B, *Scraped Lint*, commonly called *Pledgits.*

CDE,

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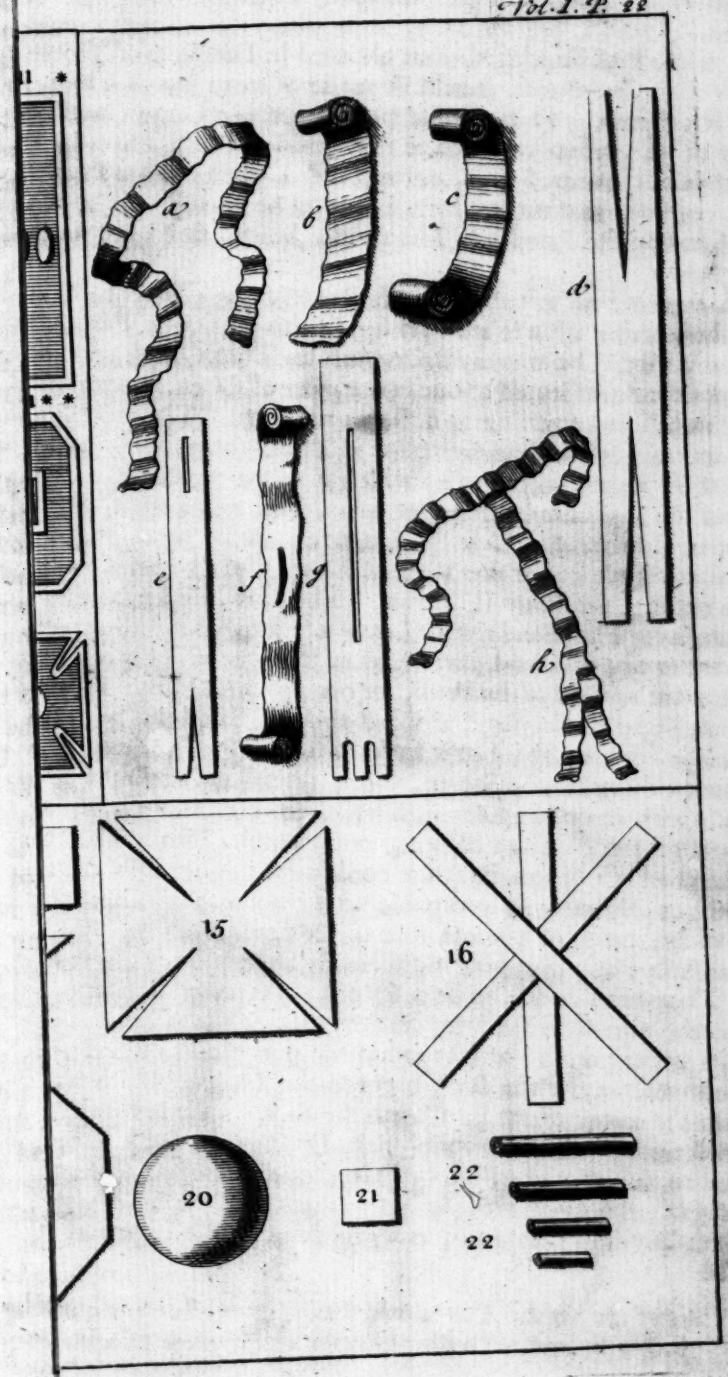
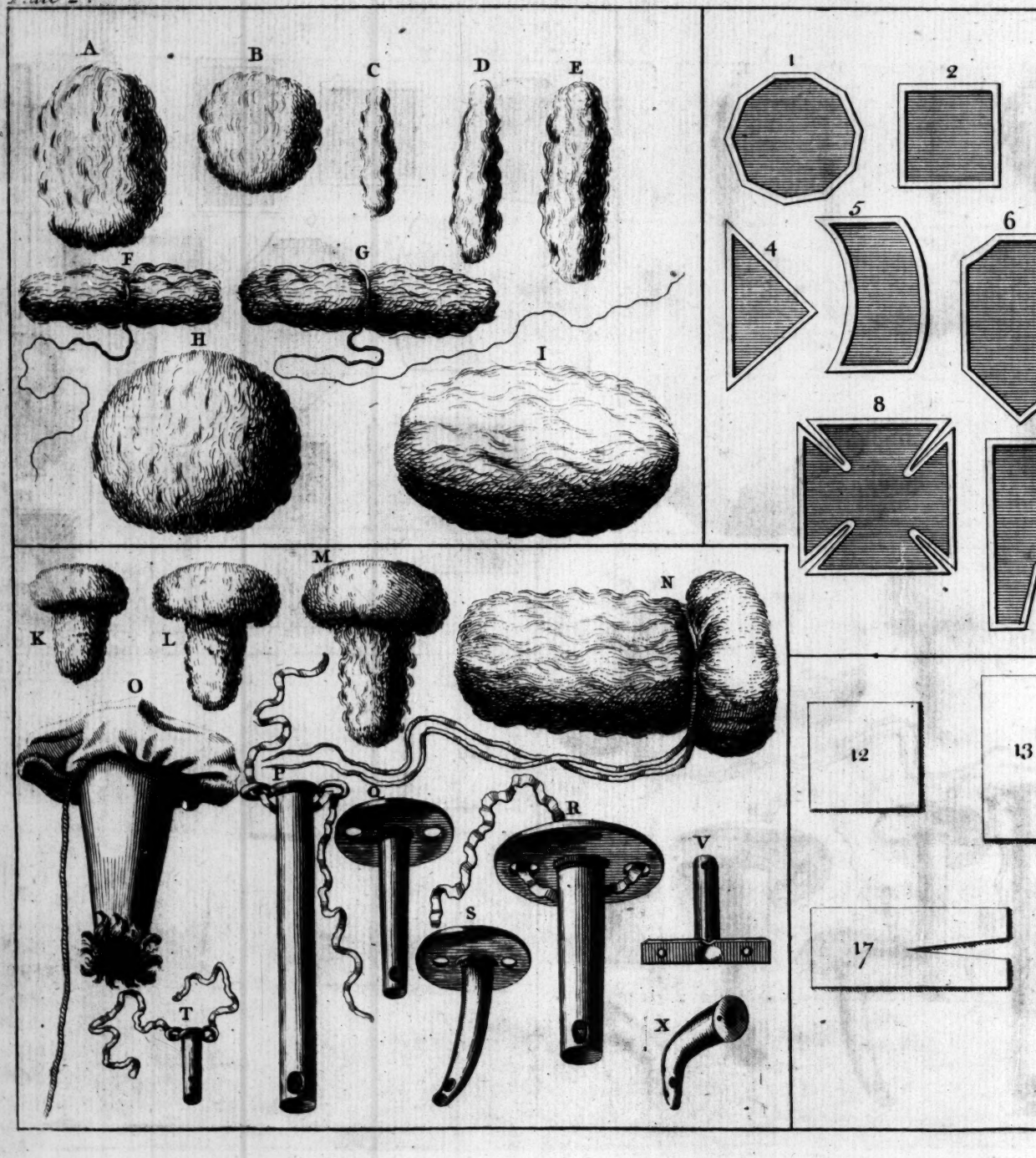
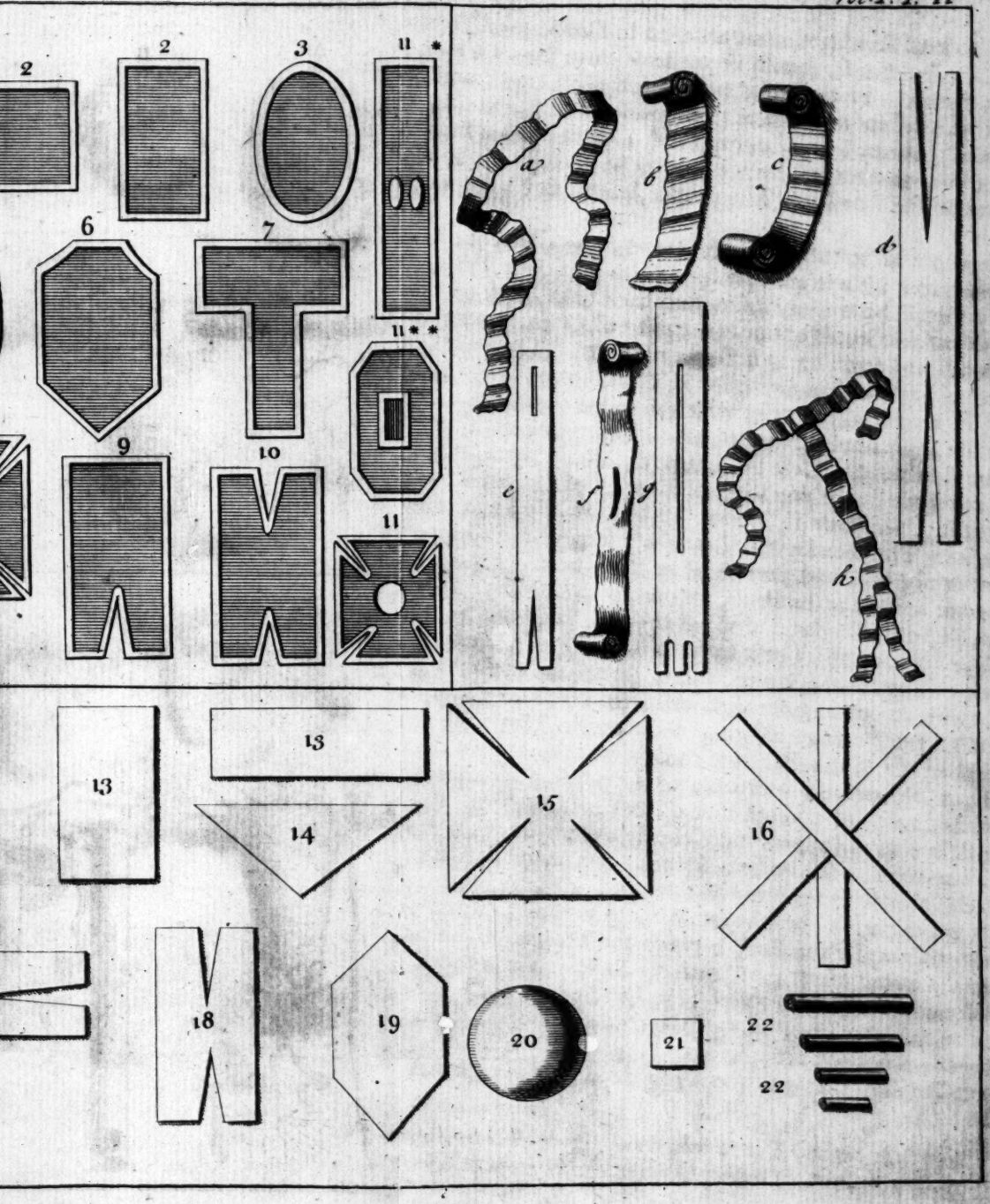


Plate 2.

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C D E, *Doſſils*, which are compoſed of Lint, worked into the Likeneſs of Olives, or Dactyle Stones.

F and G the ſame, with the Addition of a Thread tied round them.

H and I, *larger Pledgits* made of Tow.

K L M, repreſent *Tents* of different Sizes made of Lint.

N, ſhews you a very large *Tent*, with a Thread annexed to it.

O, a *Conical Tent* ſtill larger than the former, made alſo of Lint.

P Q R S T V X, *Tubes* of different kinds, made of Silver or Lead.

Number 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11. different Forms of *Plaſters*.

Num. 12, 13, 14, 15, 16, 17, 18, 19. different Sorts of *Compreſſes*.

Num. 19. three Sorts of *Compreſſes* reſembling the Form of an Aſteriſm.

Num. 20. Balls of Lint, which are ſometimes uſed as *Compreſſes*.

Num. 21. A ſmall ſquare *Compreſs*.

Num. 22. Several ſmall ſlender *Compreſſes*.

Of Bandages.

a. A ſimple *Bandage* not rolled up.

b. A *Bandage of one Head*; that is, rolled up at one end.

c. A *double-headed Bandage*, that is, one rolled up at both ends.

d. A *four-headed Bandage*.

e. A ſmall *Bandage*, particularly intended for the Security of Dreſſings that are applied to one of the Fingers, or the Penis.

f. The *uniting Bandage*, which is perforated in the middle.

g. The *Scapular Bandage*.

h. *Heliodorus*'s, or the T *Bandage*.

LXVII. Though Surgeons have formerly invented different kinds of Bandages, for every Wound that could be inflicted upon the Head, yet there is but one form that ſeems neceſſary, and that will anſwer every end that can be propoſed from this kind of Application. This is made in the following manner: Take a Handkerchief, Napkin, or any ſquare piece of Linen, double it up in a triangular Form, and apply it as we frequently do in hot Weather, when we lay aſide the uſual coverings of the Head, to moderate the exceſſive Heat of the Sun. The Bandage which is ſo much in uſe amongſt the modern Surgeons, called by the *French le grand courechef*, differs very little from this, and is commonly made of a Napkin, or ſome ſoft piece of Linen in a ſquare Form. It is doubled in ſuch a manner, that the lower part is about four Fingers breadth wider than the upper: The middle part of this Cloth is placed ſo upon the Head, that the fore part may reach almoſt as far as the Eyes, the four Extremities or Corners of it hanging over the Cheeks: The two Corners of the upper or narrower part are to be tied under the chin, at the ſame time the Corners of the lower or wider part are to be brought towards the back part of the Head, and tied together, or faſtened with a Needle and Thread. The fore part that was extended towards the Eyes, is turned back as far as the Crown of the Head; the two parts that hang over the Neck almoſt to the Shoulders are alſo to be turned back, and faſtened behind the Ears with a Needle and Thread. This kind of Bandage, when it is neatly made, ſticks cloſe to the Head, and is an excellent Contrivance to preſerve it from the Injuries it might receive from cold Air; for which reaſon it is at preſent in great Uſe and Eſteem. You may in ſome meaſure form an Idea of the Appearance it makes upon the Head by conſulting,

The moſt common Bandage for the Head.

ſulting, *Plate* III. *Fig.* 1. *Letter* A. But the method of applying it muſt be learnt from ſome ſkilful Artiſt, for it will eaſily appear from this one Inſtance, how difficult it is to deſcribe the Art of applying Bandages, by Words, and how impoſſible it is to learn this Art from ſuch Deſcriptions.

Application of the Scapular Bandage.

LXVIII. *Letter* B. *Plate* III. *Fig.* 1. deſcribes a Bandage which is generally uſed to ſecure Compreſſes and other Dreſſings that are applied to the Breaſt or Belly. The manner of preparing this Bandage is deſcribed above at *Sect.* 65. therefore in this place it remains only to ſhew the moſt convenient Method of applying it. After the Wound is dreſſed, take a double Cloth, and wrap it round the Abdomen or Thorax, ſewing not only the ends of the Cloth ſtrongly together, but faſtening it alſo in the ſame manner to the Extremities of the Scapular Bandage, to prevent it from ſlipping down; the manner in which it is done appears very plainly in *Plate* III. *Fig.* 1. *Lett.* B *and* C.

The Bandage for Phlebotomy.

LXIX. The Letter D ſhews the Bandage or Ligature that is uſed to Veins of the Arm; E to thoſe of the Foot; but we ſhall treat more largely of the manner of preparing and applying them in the third part of our Chirurgical Inſtitutions.

Names of the moſt ſimple Windings of the Bandage.

LXX. We have this farther to add concerning ſimple Bandages; they aſſume different Names according to the different Windings that they form in the manner of applying them; for inſtance, if a ſimple Bandage with one Head ſurrounds an injured part with one direct courſe, it is called *annular*, *orbicular*, or *circular*. On the contrary, if the Windings of the Bandage aſcend or deſcend equally in a ſpiral manner, they are called *obtuſe* or *ſpiral:* This frequently happens in Fractures, and other kinds of Diſorders, and is of very eminent ſervice; but when the Limbs which are to be bound in this manner are of different Thickneſſes in different parts of them, which is the caſe of the *Tibiæ*, it requires a good deal of Art to prevent the Windings of the Bandage from hanging looſe; the Bandage is to be applied to the *Tarſus*, and to be brought upwards ſo as to croſs the *Malleoli*, rolling it round the *Tibiæ* in a ſpiral manner; but when you are come up to the Calves of the Legs, each round of the Roller muſt be turned in in a particular manner, and tightened according as the Caſe requires. It is much eaſier to communicate this manner of turning in the Roller at each Round, than to deſcribe it in Words. Conſult in this Place *Plate* III. *Fig.* 1. *Letter* F. But from what has been ſaid, you will eaſily conceive the Reaſon why the Windings of the Bandages that we have been deſcribing, are generally ſaid to be inverted, and by the *French* are called *Renverſées*. Theſe Bandages are ſo managed that the Windings of the Roller are contiguous to each other; but there is another method of rolling in uſe, where the Windings of the Bandage are not ſo frequent, and keep a greater diſtance from each other, and are therefore called *creeping Bandages*, in the *French* Schools *Rempans*; an Example of which you may ſee in the left Arm of the laſt mentioned Figure at *Letter* G. Theſe creeping or ſerpentile Bandages are uſed to ſecure Compreſſes or Cataplaſms upon a diſeaſed Part.

Where the Bandage ought to begin and end.

LXXI. But leſt any one ſhould be ignorant of the neateſt and moſt proper way of applying theſe Bandages, you are diligently to obſerve what follows; to wit, when the Arm is to be dreſſed, the beginning is formed by two or three circular Windings on the Wriſt, aſcending by looſe Spires to the Cubit or Shoulder as the caſe ſhall require; but when the beginning is to be on the Foot, it is to be formed by three or four circular Windings of the Bandage round the *Tarſus* and *Metatarſus*, then proceeding in a ſerpentine Courſe up to the Knee, or, if the caſe

requires

requires it, up to the Head of the Thigh, and then, as it ſometimes happens, deſcending again; but we ſhould not neglect to mention in this place, that the beginning of the Bandage is ſometimes applied even to the diſeaſed part, as in ſeveral kinds of Fractures; ſometimes near it, above it, or below it, and ſometimes at a great diſtance from it, according to the Diſpoſition of the Wound: On the contrary, the extremity of the Bandage is ſcarce ever faſtened upon the diſeaſed part, but rather upon a ſound one, to avoid giving Pain[a]; but we ſhall treat in a more particular manner of theſe things below. In this place it is ſufficient to give you the Heads of things in a general manner.

Of Chords, Bands, Ligatures and Strings.

LXXII. The neceſſary Apparatus for Dreſſings ſeems by no means complete, without *Ligatures*, *Chords*, *Bands*, and *Strings*, and theſe of different ſorts, ſome fine, others coarſe, ſtrong, made either of Flax, or Hemp or Cloth, or Silk, or Horſe-hair, according to the nature of the Diſorder; for theſe things are almoſt conſtantly required; we uſe them to replace, or extend Bones that are broken or diſlocated, to tie the Patients down, in Lithotomy, Amputations and Operations of that kind; to tie up the Veins in Phlebotomy, to tie up Arteries after Amputations, or, in large Wounds, to ſecure the Splints that are applied to Fractures, to tie up the Proceſſes of the Peritonæum with the Spermatic Veſſels in Caſtration; and, laſtly, in taking off Warts and other Excreſcences by Ligature, and in all other Operations of this kind, as we ſhall more fully explain below.

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But nevertheleſs extremely neceſſary.

LXXIV. But although the attainment of Surgery had been ſtill more difficult than it is, yet as we do not enquire into the Difficulties, but the Honours and Uſes that attend the Acquiſition of an Art or Science, before we make choice of it; this is ſo far from being a Diſcouragement to generous minds, that it is rather an incitement to their Induſtry. That Surgery is extremely neceſſary for the Preſervation of Life, does not only appear from what we have already laid down, but from the neceſſity the Phyſicians frequently lie under of calling for the aſſiſtance of this Art, not only in external Diſorders, (to which ſome would impertinently confine Surgery) but in internal Complaints alſo, where Medicines, and a proper Diet, are in no wiſe equal to the Cure, as in the Cataract, Stone in the Bladder, Empyema, Dropſy, Suppreſſion of Urine, difficult Births, and an infinite num-

[a] See Celſus, Book V. Chap. 26. Number 24.

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ſulting, *Plate* III. *Fig.* 1. *Letter* A. But the method of applying it muſt be learnt from ſome ſkilful Artiſt, for it will eaſily appear from this one Inſtance, how difficult it is to deſcribe the Art of applying Bandages, by Words, and how impoſſible it is to learn this Art from ſuch Deſcriptions.

Application of the Scapular Bandage.

LXVIII. *Letter* B. *Plate* III. *Fig.* 1. deſcribes a Bandage which is generally uſed to ſecure Compreſſes and other Dreſſings that are applied to the Breaſt or Belly. The manner of preparing this Bandage is deſcribed above at *Sect.* 65. therefore in this place it remains only to ſhew the moſt convenient Method of applying it. After the Wound is dreſſed, take a double Cloth, and wrap it round the Abdomen or Thorax, ſewing not only the ends of the Cloth ſtrongly together, but faſtening it alſo in the ſame manner to the Extremities of the Scapular Bandage, to prevent it from ſlipping down; the manner in which it is done appears very plainly in *Plate* III. *Fig.* 1. *Lett.* B *and* C.

The Bandage for Phlebotomy.

LXIX. The Letter D ſhews the Bandage or Ligature that is uſed to Veins of the Arm; E to thoſe of the Foot; but we ſhall treat more largely of the manner of preparing and applying them in the third part of our Chirurgical Inſtitutions.

Names of the moſt ſimple Windings of the Bandage.

LXX. We have this farther to add concerning ſimple Bandages; they aſſume different Names according to the different Windings that they form in the manner of applying them; for inſtance, if a ſimple Bandage with one Head ſurrounds an injured part with one direct courſe, it is called *annular*, *orbicular*, or *circular*. On the contrary, if the Windings of the Bandage aſcend or deſcend equally in a ſpiral manner, they are called *obtuſe* or *ſpiral*: This frequently happens in Fractures, and other kinds of Diſorders, and is of very eminent ſervice; but when the Limbs which are to be bound in this manner are of different Thickneſſes in different parts of them, which is the caſe of the *Tibiæ*, it requires a good deal of Art to prevent the Windings of the Bandage from hanging looſe; the Bandage is to be applied to the *Tarſus*, and to be brought upwards ſo as to croſs the *Malleoli*, rolling it round the *Tibiæ* in a ſpiral manner; but when you are come up to the Calves of the Legs, each round of the Roller muſt be turned in in a particular manner, and tightened according as the Caſe requires. It is much eaſier to communicate this manner of turning in the Roller at each Round, than to deſcribe it in Words. Conſult in this Place *Plate* III. *Fig.* 1. *Letter* F. But from what has been ſaid, you will eaſily conceive the Reaſon why the Windings of the Bandages that we have been deſcribing, are generally ſaid to be inverted, and by the *French* are called *Renverſées*. Theſe Bandages are ſo managed that the Windings of the Roller are contiguous to each other; but there is another method of rolling in uſe, where the Windings of the Bandage are not ſo frequent, and keep a greater diſtance from each other, and are therefore called *creeping Bandages*, in the *French* Schools *Rempans*; an Example of which you may ſee in the left Arm of the laſt mentioned Figure at *Letter* G. Theſe creeping or ſerpentile Bandages are uſed to ſecure Compreſſes or Cataplaſms upon a diſeaſed Part.

Where the Bandage ought to begin and end.

LXXI. But leſt any one ſhould be ignorant of the neateſt and moſt proper way of applying theſe Bandages, you are diligently to obſerve what follows; to wit, when the Arm is to be dreſſed, the beginning is formed by two or three circular Windings on the Wriſt, aſcending by looſe Spires to the Cubit or Shoulder as the caſe ſhall require; but when the beginning is to be on the Foot, it is to be formed by three or four circular Windings of the Bandage round the *Tarſus* and *Metatarſus*, then proceeding in a ſerpentine Courſe up to the Knee, or, if the caſe

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ber of other Caſes. Amongſt the great numbers that have been Scoffers and Deriders of Phyſic, there have been very few ſo hardy as to reject Surgery as an uſeleſs Art: For indeed he muſt be entirely given up to Impudence and Folly that would pretend this to be an uſeleſs Art, by whoſe Aſſiſtance the moſt grievous Diſorders that the Body is ſubject to are relieved; to wit, Wounds, and the Loſs of Blood that is conſequent upon them, Fractures or Luxations of the Bones, Stones in the Bladder, Suppreſſion of Urine, and an infinite number of others.

Surgery the moſt certain part of Phyſic.

LXXV. I would have no one be ſurprized at the Aſſertion that Surgery ſurpaſſes all other branches of Phyſic in point of Certainty; what *Celſus* ſaid formerly upon this occaſion is very true[a], "The effects of Surgery are more evi- "dent than thoſe of any other branch of Phyſic: Since in Diſeaſes Nature or Ac- "cident may do much, and the ſame Medicines have ſometimes a good effect, "and ſometimes no effect at all, ſo that it becomes matter of doubt whether "Health be the effect of the Medicines that have been adminiſtred, or of a good "natural conſtitution of the Body; but in Diſorders that are relieved by the Aſ- "ſiſtance of the Hand, it is very evident from whence the good effect proceeds." Whatever good effects we produce by ſtopping violent Hæmorrhages, by taking off Tumors and Excreſcences, by curing Herniæ, by cutting for the Stone, by couching Cataracts, by drawing forth ſuppreſſed Urine, by changing the croſs poſition of the Infant in the Womb, and bringing it into the World, by ſetting broken Bones, and reducing luxated ones, and by relieving other Diſorders of this ſort; for all this we are evidently obliged to the Hand of the ſkilful Surgeon.

Students in Surgery incited to Induſtry.

LXXVI. Having premiſed this by way of Introduction, we cannot avoid again and again exciting all Students of this noble Art to Diligence and Induſtry, and not to reſt ſatisfied with being able to ſhave, ſpread a Plaſter, or open a Vein; for I would have them know, that not only a good natural Sagacity, but great Labour and Study alſo are abſolutely required to qualify a Man for ſo great a Truſt as that of taking care of the Health of Mankind. The Students in Surgery ſhould not only be furniſhed with Strength of Body, but Conſtancy of Mind alſo, that they may remain unmoleſted and unmoved by the Stench, Blood, Pus, and Naſtineſs that will naturally occur to them in their Practice; they ſhould conſider that by frequent exerciſe theſe things will become cuſtomary to them, and they will acquire another nature as it were, and a Surgeon ſhould ſuffer any thing of this kind, rather than neglect any thing that might be for the benefit of his Patient; for then he will have performed his duty properly, and have ſatisfied his own mind, when he has done every thing that comes within the compaſs of his Art for the Service of his Patient.

[a] See Lib. VII. Præfat. and Hippocrates de Arte, V.

INSTITU-

INSTITUTIONS OF SURGERY.

PART the FIRST.

Of the five Kinds of Diſorders of the Body.

BOOK the FIRST.

Of WOUNDS.

CHAPTER I.

Of WOUNDS *in general.*

A Wound, what?

I. WE were perſuaded by two Reaſons to begin theſe Inſtitutions of Surgery with an Enquiry into the Nature of Wounds; for Wounds are not only more common than any other external Injuries, but the Nature of them alſo is more eaſily explained in our Schools of Surgery: And indeed when we are thoroughly acquainted with the Nature of a Wound, we ſhall with much greater Eaſe and Clearneſs comprehend all the other Doctrines of Surgery. What a *Wound* is, the moſt unſkilful are acquainted with; but it is frequently defined to be *a violent Solution of the Continuity of the ſoft external Parts of the Body, made by ſome Inſtrument*; others take a greater Latitude in defining it, *and call every external Hurt of the Body, by what Cauſe ſoever produced, a Wound*; ſo, for Inſtance, they reckon violent Strokes upon the Head, Thorax, or Abdomen, under the Title of Wounds, though no external Parts are divided, as will eaſily appear from what we ſhall ſay below, when we come to treat of mortal Wounds.

Differences of Wounds in relation to the inflicting Inſtrument.

II. On the other hand, ſome are of Opinion that unleſs the injured Parts of the Body are divided by ſome ſharp Inſtrument, as by a Sword or Knife, it is by no means to be called a Wound; though it plainly appears from what has been already ſaid, that thoſe Injuries which are produced by blunt Inſtruments, may properly enough be called Wounds: Under this Head are Gun-ſhot Wounds, Wounds inflicted by Stones, Clubs, or that come by violent Falls. Therefore we may conſtitute two Differences of Wounds; the one made by *acute*, the other by *blunt Inſtruments*.

On what Parts of the Body Wounds are inflicted.

III. Wounds are generally inflicted upon the *ſofter Parts of the Human Body*, ſuch as the Skin, Fat, Muſcular Fleſh, Ligaments, Blood-Veſſels, and Nerves, and Parts that are compoſed of theſe, as the Viſcera and Inteſtines; but whilſt we are aſſerting this, we muſt by no means entirely exclude *the more ſolid Parts of the Body, as the Bones*; ſince the Bones themſelves afford frequent Examples of Injuries received from ſharp Inſtruments: The Parts therefore that are ſubject to theſe Injuries, will afford us two Diſtinctions of Wounds; one, *Wounds of the ſoft Parts*; the other, *Wounds of the Bones*.

Cauſes of Wounds.

IV. As *Cauſes of Wounds*, all Inſtruments of what kind ſoever, whether blunt or ſharp, may properly be reckoned, provided they are of ſuch a Nature, that upon the violent external Application of them they are capable of producing a Solution of Continuity in the Parts of the Body upon which they are inflicted; for a Solution of the external Parts from an internal Cauſe is not called a Wound, but rather an *Abſceſs*, or *Ulcer*. So when the harder Parts of the Body, to wit, the Bones, are broken by a Fall, or by a violent Blow received from a blunt Inſtrument, we do not call that a Wound, but a *Fracture*.

Effects of Wounds.

V. *The Effects which are produced by Wounds*, beſides the Diviſion of the ſofter Parts, are generally *Profuſions of Blood*, though they are ſometimes attended with much greater Miſchiefs than theſe; for it can ſcarcely happen but that the divided Parts muſt in ſome Meaſure, if not totally, loſe their natural Functions, according to the different Uſes for which the Part is intended, and according to the different Degree of Injury that it receives; the greater Number of Uſes a Part is intended for by Nature, the worſe will be the Conſequence of a Wound upon that Part. This Principle is ſo extenſive, that we are always guided by it in forming our Prognoſtic whether the Wound will prove mortal or not: He therefore that is beſt ſkilled in Anatomy, that is beſt inſtructed in the Situation of the Parts, and their Uſes, will be enabled to form the moſt accurate Judgment of the Conſequences that will neceſſarily attend a Wound upon any particular Part.

Different Sorts of Wounds.

VI. What we have taught of the different Situations and Cauſes of Wounds, ſufficiently demonſtrates that there are many different kinds of Wounds; ſome are brought on by *Puncture*, ſome by a *Stab*, and ſome again by a *Blow*; ſome are *curable*, others *incurable*; ſome are made with *ſharp Inſtruments*, others with *blunt* ones; with regard to their *Figure*, ſome form a *right Line*, others are *curve*, *tranſverſe*, or *oblique*; with reſpect to their *Situation*, ſome are ſeated in the *Head*, others in the *Neck*, *Thorax*, or *Abdomen*; and of theſe ſome are *external*, others *internal*. Variety of different kinds of Wounds ariſe from the great diverſity of Condition that Wounds are left in; for in ſome Wounds the inflicting Inſtrument, or Part of it, remains: For Inſtance, a Leaden Bullet, a Piece of Glaſs, or of a Grenade, the Points of Swords or Arrows; but in ſome Wounds nothing of this kind is left. Sometimes *Fractures of the Bones* accompany Wounds, which we almoſt always find to be the Caſe in Wounds of the Head, and in Gunſhot Wounds. Some Wounds alſo are attended with Poiſon, as thoſe which are made with poiſoned Arrows, or other Inſtruments. Under this Head we may very properly rank the Bites of Animals, but more particularly of mad or venomous Animals. Some are of Opinion that Wounds which are made with Copper or Silver Inſtruments ſhould be reckoned in this Claſs, the Poiſon of which, if there is any, is owing to the Vitriol that is mixed with theſe Metals.

VII. In

What appears after a ſlight Wound.

VII. In *ſlight Wounds*, that is to ſay, where no conſiderable Vein, Artery, Nerve or Tendon is concerned, you will uſually remark the following *Appearances*; at firſt Sight the Wound appears to us as a red Line drawn upon the Part, but upon being dilated the Blood inſtantly guſhes out, in greater or ſmaller Quantities, in Proportion to the Size and Number of the Blood-veſſels that are injured. The Hæmorrhage after a ſhort Continuance ſtops of its own accord, and the Blood concreting in the Wound forms a Cruſt: The Lips of the Wound now begin to look red, and ſwell, and are attended with ſome degree of Pain and Inflammation; if it is a large Wound, a Fever, that is to ſay, an univerſal Heat and Quickneſs of Pulſe almoſt always enſue upon the third or fourth Day, ſooner or later a whitiſh glutinous Humour, not unlike white Oil, appears; and this is known to the Surgeons by the name of *Pus*, or *Matter*; upon the Appearance of Matter, the Redneſs, Tumor, Pain, Inflammation and Fever diſappear entirely, or at leaſt are ſenſibly abated: And theſe are the Signs of a Wound inclining to heal; for, under the Matter we have deſcribed, new Fleſh ſprings up from the wounded Veſſels, which having by degrees filled the Wound, dries upon its upper Part, and forms a Cicatrix.

What after dangerous Wounds.

VIII. In *dangerous Wounds*, that is, where any conſiderable Blood-veſſel is wounded or divided, there generally enſues ſo violent an *Hæmorrhage*, that the wounded Perſon is in an Inſtant ſenſible of great loſs of Spirits, and Weakneſs, and faints away; and when the larger Arteries are wounded, whether they are internal or external, he dies upon the Spot. Although ſomewhat leſs Danger is apprehended from Wounds that are inflicted upon the Veſſels, which are ſituated upon the external Parts of the Body, (ſome few excepted) becauſe they will admit of the Ligature, and other Means for reſtraining the Violence of the Hæmorrhage; nevertheleſs it is almoſt impoſſible to prevent the Limbs which lie below the Diviſion of the Artery, and are uſed to receive their Nouriſhment by that Channel, from becoming Paralytic; nay, ſometimes, from mortifying. This is almoſt conſtantly the Caſe when the Trunk of the Brachial or Crural Artery is divided.

What follows the partial Diviſion of a Blood-veſſel.

IX. The Conſequences we have juſt related, follow upon the total Diviſion of a conſiderable Vein or Artery; it remains now that we conſider what will follow upon a partial Diviſion of them. Whenever a large Artery is wounded, and not entirely divided, the wounded Fibres inſtantly contract themſelves: By this means they dilate the Orifice of the Wound, and render it difficult to ſtop the Flux of Blood; and though the Hæmorrhage be ſtopped for a little Time, yet it will burſt out again on a ſudden violently, or at leaſt produce a dangerous Tumor, called an *Aneuriſm*. This will frequently be the Caſe, when only the external Coat of the Artery is wounded; for by this means the internal Coat of the Artery is left to ſuſtain the whole *Impetus* of the Pulſe, which it being unequal to, is forced by degrees into a Tumor like a Bag, which frequently brings on great Miſchiefs; but of this Caſe we ſhall treat more fully in another Part of this Work.

Conſequences following from a wounded Nerve.

X. Upon *the diviſion of a Nerve*, the Limb to which that Nerve was extended becomes inſtantly rigid, void of Senſation, and withers; ſo it is no wonder that a Man inſtantly expires upon the diviſion of thoſe Nerves that are ſent to the Heart, or *Diaphragm*. A Wound alſo is attended with great Danger, where the Nerve is only partially wounded, and not entirely divided; for the wounded Fibres contract themſelves, and thoſe that remain undivided ſuffer too great Exten-

ſion, which will bring on moſt violent Pain, Spaſms, Convulſions, Inflammations and Gangrenes, and ſometimes Death itſelf.

Conſequences of a wounded Tendon.

XI. When *a Tendon is wounded or divided*, the Part to which it belongs loſes its Motion; but if it is divided only in part, it will produce much the ſame Symptoms with a Nerve in the ſame Circumſtances. The Conſequence of Wounds upon the internal Parts you will find more fully explained, when we come to treat of the *Diagnoſis* and *Prognoſis* of Wounds.

Of the *Diagnoſis* of Wounds in general.

XII. The *Diagnoſis* of Wounds is for the moſt part extremely eaſy; for the Size, Situation, and Nature of the Wound generally lie open to the Sight. Nevertheleſs there are ſome Caſes that are not very uncommon, where it is ſomewhat difficult to diſcover the true Nature of the Wound; but in order to make the more eaſy Diſcovery whether the Wound is deep or ſuperficial, whether any of the internal Parts are wounded or not, the Surgeon ſhould always be careful, upon the firſt Viſit, to clean the wounded Part with a Sponge ſqueezed out of warm Wine or Water, that he may have a clear View of the Bottom of the Wound; but whenever the Flux of Blood from the Wound is very violent, it muſt be inſtantly dreſſed up, and the Cleaning of it in this manner deferred till it is in a quieter Diſpoſition.

What internal Parts are wounded, may be diſcovered,

1. By Anatomy.

2. By the Poſture of the wounded Perſon.

3. By the Poſture and Degree of Force uſed by the wounding Perſon.

4. By viewing the Weapon.

5. By the Diſturbance given to Actions of particular Parts.

XIII. In deep Wounds we are to examine whether the fat and fleſhy Parts are the ſole Objects of the Wound, or whether ſome conſiderable Blood-veſſels, or other internal Parts are not Partakers of the Injury. We are aſſiſted in this Examination by ſeveral Means: Our firſt Aſſiſtance we receive from the Knowledge of *Anatomy*; ſince by that Science we are taught the Situation of each particular Artery, Nerve, Tendon, Viſcus and Inteſtine. The *Poſture of the wounded Perſon* at the Time he received the Injury, is alſo to be diligently conſidered, whether he was ſtanding upright, or lying down; and by this Means we may with ſome Certainty judge what Parts were Sufferers by the Wound, and how far the Weapon penetrated. We are alſo to conſider of *the Poſture, Manner, and Force uſed by the wounding Perſon*; for the greater degree of Force there was in dealing the Blow, ſo much the larger and deeper will the Wound be. Nor may we neglect here to enquire after *the Shape of the Weapon* by which the Wound was inflicted; ſince by conſidering its Size, and obſerving the Quantity of Blood that adheres to it, we may in ſome meaſure judge of the Depth of the Wound.

XIV. In a word, there is nothing will give you truer Light into the Nature and Conſequence of a deep Wound, than a due Conſideration of what natural Actions of the Body are impeded thereby: For Inſtance, in Wounds of the Breaſt, when the Patient draws his Breath with Shortneſs and Difficulty, and is at the ſame time attended with an Hæmoptyſis and Hiccoughs, we may fairly conjecture that the *Lungs* or *Diaphragm* are wounded; ſo in Wounds of the Abdomen, when Chyle is voided, it is a plain Indication that the *Stomach, ſmall Guts*, or *Via Lactea* are wounded; when Excrements paſs by the Wound, the *great Guts* are wounded: In the ſame manner, bilious Blood ſhews the *Liver* or *Gall-bladder* to be divided; if Urine paſſes by the Wound, the *Bladder of Urine*, or *Ureters*, are injured; but bloody Urine denotes a Blow on the *Kidneys*, or a Wound of the *Bladder*; but when there are large Profuſions of Blood this way, it is a Sign that ſome of the larger Blood-veſſels are wounded; Vomiting of Blood declares the *Stomach* to be the injured Organ; *violent Pains*, attended with *convulſive Twitches*, ſhew that a Nerve is wounded, or that ſome foreign

Subſtance is left in the Wound; whenever the Senſes are diſordered after a Wound received upon the Head, a Concuſſion of the Brain is much to be feared; Difficulty of Breathing, Pains in the Breaſt, and Hiccoughing, are Symptoms of a Wound in the *Diaphragm.*

XV. What we have laid down concerning the general Method of forming the *Diagnoſis* on Wounds, will alſo ſerve us in forming their *Prognoſis*, or Judgment of the Conſequences that will attend them: For, after a due Conſideration of the Nature of a Wound, and the Symptoms attending it, it will be no very difficult Matter to determine whether it be attended with great Danger or not; whether the Cure will be difficult or eaſy; whether it will be a perfect or imperfect Cure. We may remark in general, that ſlight Wounds admit of an eaſier Cure than deep ones: *Young Men in Health* are eaſier cured than old diſeaſed Perſons, particularly than hydropical, conſumptive, ſcorbutical, or pocky Perſons; the Cure is eaſier performed in *a temperate Air* than in a cold or hot Climate; there are alſo greater Hopes of Succeſs where there are no violent Symptoms attending, as Hæmorrhages, large Tumors, violent Pains, Convulſions, Inflammation, Fever. But *Hippocrates* has very rightly remarked [a], "Where a large Wound is made, "it is a very bad Sign if no Tumor ſucceeds." This *Celſus* has explained in a much more elegant manner [b]: "It is of bad Conſequence for a Wound to be at- "tended with a large Tumor; but it is of the laſt Conſequence, if it is attended "with no degree at all of Tumor; the firſt is an Indication of great Inflamma- "tion, the laſt of Mortification." Some degree of Tumor therefore is beſt.

Of the Prognoſis of Wounds.

XVI. We come now to enquire what *Wounds admit of Cure*, and what are *incurable*. The Knowledge of this Point is no leſs uſeful and neceſſary to the Phyſician and Surgeon, than it is difficult to attain; and more eſpecially as the Law inflicts a very heavy Puniſhment upon Murderers, it is of very great Conſequence to be able to diſtinguiſh what Wounds are of themſelves mortal, and what only become ſo by Accident, or Neglect. In order to enable the Surgeon to anſwer Queſtions upon this Head with greater Readineſs and Certainty, we ſhall be very particular in this Article; therefore, in this View, we ſhall divide Wounds into three ſorts. Some Wounds, 1. are abſolutely of themſelves mortal; others, 2. are in their own Nature mortal, if not relieved by timely Aſſiſtance; others laſtly, 3. become mortal by Accident, or imprudent Treatment, though they were otherwiſe curable.

Whether Wounds are curable or incurable.

XVII. We properly ſtile thoſe *Wounds mortal, which are not to be remedied by all the Art and Induſtry of Man*; ſo thoſe Wounds are juſtly deemed mortal, that are attended with ſo violent an Hæmorrhage as to produce inſtant Death; in this Claſs are reckoned Wounds that penetrate the Cavities of the Heart, and all thoſe Wounds of the *Viſcera* where the large Blood-veſſels are opened; ſuch are large Wounds of the Lungs, Liver, Spleen, Kidneys, Stomach, Inteſtines, Meſentery, Pancreas, Uterus, Aorta; of the Iliac, Cœliac, Renal, Meſenteric, and Carotid Arteries, (eſpecially if they are wounded near their Origin) of the Subclavian alſo or Vertebral, of the Vena Cava, the Iliac Vein, internal Jugular, Vertebral, Renal, Meſenteric, of the Vena Porta, and of other large Veins that lie deep in the Body; becauſe their Situation will not admit of proper Applications to reſtrain the Flux of Blood. I think therefore I may very juſtly reckon

I. Mortal Wounds. 1. Where there is an Hæmorrhage not to be ſtopped by Art.

[a] Hippocr. Aphoriſm, 66. Sect. V. [b] Book V. Chap. 26.

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theſe amongſt the Wounds that are abſolutely incurable, ſince they are not remediable either by Aſtringents, Ligature or Fire.

2. Where the Communication is cut off between the Head and the Body.

XVIII. Thoſe Wounds are no leſs mortal than the former, *which obſtruct or entirely cut off the Paſſage of the Animal Spirits to the Heart.* Such are Wounds of the Cerebellum, Medulla Oblongata, and ſome violent Strokes of the Brain itſelf. There is reaſon to apprehend very great Danger, when the ſmall Veins or Arteries which are contained in the Cranium are injured: For the Blood flowing from them into the internal Sinuſes of the Brain, either produces too great a Preſſure upon thoſe very tender Parts of the Brain, and ſo obſtructs the Courſe of the Blood and Spirits; or, being corrupted, putrifies the Brain itſelf, if it cannot be evacuated by the Aſſiſtance of the Trepan; which is the Caſe when this Accident happens at the lower Part of the Cranium, or in the Sinuſes of the Brain. Nor is there leſs Danger, where *the Nerves which tend to the Heart* are wounded, or entirely divided; for, after this, it is impoſſible for the Heart to continue its Motion.

3. Where the Power of Breathing is taken away.

XIX. To this Claſs alſo are to be referred *all Wounds that entirely deprive the Animal of the Faculty of Breathing.* Therefore there is great Danger where the *Aſpera Arteria* is completely divided; for, where it is only divided in part, it may be healed again by the Aſſiſtance of an expert Surgeon. I have many [a] Hiſtories of Cures of this kind, both by myſelf and others; to this Place alſo belong violent Shocks of the *Bronchia*, *Mediaſtinum* and *Diaphragm*, eſpecially the tendinous Part of it.

4. Where the Courſe of the Chyle is interrupted.

XX. Thoſe Wounds alſo *which interrupt the Courſe of the Chyle to the Heart*, are no leſs incurable than the former; ſuch are Wounds of the Stomach, Inteſtines, Receptacle of the Chyle, Thoracic Duct, and larger Lacteals; to which we may add Wounds of the Œſophagus, if they are large; though Death is not ſo ſudden an Attendant upon theſe Wounds, but for want of Nouriſhment they are greatly weakened by degrees, and die conſumptive.

5. Where the abdominal Fluids, which are contained in Membranes, are extravaſated.

XXI. In this Place we muſt by no means omit to ſpeak of *Wounds which are inflicted upon membranous Parts that are ſituated in the Abdomen, and contain ſome ſecreted Fluid*, as on the Bladders, either for the Bile or Urine, the Stomach, Inteſtines, Receptacle of the Chyle, and Lacteal Veſſels. The Fluids contained in theſe Parts, when once they are let looſe into the Cavity of the Abdomen, cannot be properly diſcharged, and therefore eaſily corrode the internal Parts of the Body, and the Membranes that contained them are generally ſo fine, that they will not admit of Agglutination, eſpecially ſince no Medicine from without can be applied: A few indeed have recovered after ſlight Wounds in theſe Parts; but, ſince that Number is but few, and the Cure was accidental, and not performed by the Surgeon's Art, I think I am ſufficiently juſtified in adding theſe to the Number of incurable Wounds.

II. Wounds proving mortal, if left to themſelves.

XXII. We have hitherto been treating of Wounds that were curable by no Art or Induſtry; we proceed now in order to deſcribe thoſe *which prove fatal if neglected and left to Nature*; by theſe we mean thoſe Wounds that produce inſtant Death, unleſs relieved by preſent Aſſiſtance, but are curable by a good Surgeon called in time; ſuch are Wounds of the larger external Blood-veſſels, which might be remedied by Ligature, by the Application of aſtringent Medicines, or of the actual Cautery. Of this kind are Wounds of the Brachial or Crural

[a] See *Bohnius de Vuln. renunc.* p. 21. though he reckons theſe among incurable Wounds.

Artery,

Artery, unleſs they are too near the Trunk of the Body. Wounds in the large Arteries of the Cubit or Tibia, of the Branches of the external carotid and temporal Artery, are of this kind; to theſe may be added Wounds of the Jugular, and other Veins ſituated upon the external Parts of the Body; but in theſe Caſes we always ſuppoſe that Help is called for before there has been a vaſt Profuſion of Blood.

III. What Wounds become mortal by Accident.

XXIII. *Wounds are properly ſaid to become mortal by Accident, where the Patient's Death is occaſioned either by the ill Conduct of the Patient himſelf, or by the Ignorance or Neglect of his Surgeon, the Wound itſelf being deemed curable.* Under this Head are to be reckoned, 1. *Thoſe Wounds which the Surgeon has neglected to cleanſe ſufficiently, though he had it in his Power to do it*; as when ſome foreign Body, which might eaſily have been extracted, is left in the Wound by the Careleſneſs of the Surgeon, and produces Inflammations, Hæmorrhages, Convulſions, and at laſt Death itſelf. So in Wounds of the Thorax and Abdomen, if the Surgeon does not uſe his utmoſt Diligence to evacuate the grumous Blood, it will corrupt there, and, by drawing the neighbouring Parts into Conſent, will expoſe the Patient to inſtant Death [a]. Therefore great Care muſt be taken that the Lips of the Wound do not cloſe till the Blood which is collected in the Cavity of the Body be all evacuated, if poſſible: Which you will eaſily perceive by the Difficulty of Breathing, and other bad Symptoms being removed [b]; but if any of the larger internal Veſſels are wounded, then all Attempts to diſcharge the Blood are vain; for the Violence of the Hæmorrhage takes off the Patient. 2. *Wounds*

[a] There are ſome Caſes where the Surgeon finds all his Attempts to evacuate the Blood fruitleſs, and there he is in no wiſe to be blamed; but the Wound is to be looked upon as mortal. Take the following Caſe by way of Example: In the Year 1725, a Man received a Wound by a Sword, the Sword entered about half an Inch below the right Pap, between the fifth and ſixth Ribs, and paſſed downwards through the Diaphragm into the Cavity of the Abdomen. Now although a conſiderable Quantity of Blood was diſcharged by the Wound for the three firſt Days, yet it was impoſſible that the Blood which was extravaſated in the Cavity of the Abdomen ſhould be diſcharged by the Wound at the Breaſt, the Patient therefore died on the eighth Day; his Body being opened, we found a large Quantity of grumous Blood under the Liver, which adhered ſo ſtrictly to its concave Part, that we found it difficult to ſeparate them with our Fingers. Upon clearing away the Blood, we perceived a Wound through the Body of the Liver about half an Inch wide, and a Wound anſwering to that in the muſcular Part of the Diaphragm. There were two or three Ounces of Blood found in the lower Part of the Abdomen, but none in the Cavity of the Thorax. From the Impoſſibility that appeared of diſcharging the extravaſated Blood, and the Largeneſs of the Wounds of the Veſſels, I pronounced this Wound mortal; but to my great Surprize ſome Phyſicians declared it ſo only *per accidens*, for which reaſon the Murderer was acquitted. Whoſe Opinion was moſt juſtifiable, I leave to others to determine. See *Fr. Hoffman. Conſult.* Tom. I. p. 376, and the following.

[b] The Surgeon is not to be blamed if he is ſometimes deceived in this Point; of which I will here give you a notable Inſtance: In the Year 1726 a Man at *Helmſtadt* was wounded in ſuch a manner under the right Pap, that the Blood did not only flow in great Quantities from the Wound, but diſcharged itſelf alſo by the Mouth; but in two Days Time the Diſcharge of Blood, both at the Wound and by the Mouth, entirely ceaſed, and the Patient found himſelf in ſo good Order, that he expected in a very ſhort Time to get abroad; he breathed ſo freely, that he eaſily prevailed upon me to remove the Tent that I had put in to keep the Wound open; but, behold the Conſequence! after remaining in this manner entirely eaſy for two Days, on the third he died ſuddenly; upon opening the Thorax we found at leaſt a Pound of extravaſated Blood, which could by no means have been diſcharged, ſince there appeared no Symptom which could give Room to ſuſpect that there remained any extravaſated Blood concealed. Beſides, BELLOST, DE LA MOTTE, and ſeveral other celebrated Surgeons amongſt the Moderns, abſolutely forbid keeping Wounds of the Breaſt open by the Uſe of Tents; though I doubt much whether this Advice is always to be followed; but I leave this to the Determination of others.

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alſo are reckoned mortal by Accident, which are treated or ſearched in too rough a manner by the Surgeon; for, if you handle Wounds roughly, that are full of nervous Parts or large Blood-veſſels, there is great Danger of bringing on Hæmorrhages, Convulſion, Inflammation, Gangrene, and Death itſelf. The Caſe alſo is the ſame, 3. *In external Wounds, which are ſlight of themſelves; but the Patient is loſt by the Violence of the Inflammation, which is brought on, and encreaſed by the Surgeon's injudicious Treatment*; or, 4. *When any one is taken off by the Violence of the Hæmorrhage from a Wound of the Hand or Foot*; for in this Caſe a Surgeon might eaſily have ſtopped the Blood by the Application of proper Remedies, or by Ligature; or, 5. *Where the Patient is guilty of any Intemperance in eating or drinking, of exceſs of any Paſſion, of expoſing himſelf to the cold Air, or of uſing any violent Exerciſe*; for by this means Wounds, more eſpecially thoſe of the Head, by being liable to freſh Hæmorrhages, and other dangerous Accidents, frequently become mortal, notwithſtanding the Surgeon uſes his utmoſt Care and Skill. Under this Head alſo are to be reckoned, 6. *Thoſe Wounds of the Head where the Patient is loſt by the vaſt Quantity of Blood which is extravaſated in the Cavity of the Cranium, and confined there; but where he might have been relieved, if the Trepan had been uſed in time*; for, though Wounds of this kind generally prove incurable, yet, as there is a Poſſibility of ſaving a Perſon in theſe Circumſtances by the Uſe of the Trepan, this may properly be reckoned amongſt the doubtful Caſes, and not deemed abſolutely mortal. Laſtly, 7. *A bad Habit of Body frequently prevents the Cure of Wounds, which would admit of an eaſy Cure in an healthy Subject*; ſo you frequently ſee the ſlighteſt Puncture in the Hand or Foot of an hydropical, conſumptive, or ſcorbutical Perſon, ſhall produce a Gangrene, and prove mortal, though the Surgeon neglects no proper Application to prevent it. I know very well that ſome Phyſicians reckon all Wounds of this kind as abſolutely mortal; but, I think, they are much better juſtified who pronounce a milder Sentence, and deem of the doubtful kind.

It is difficult to form a Judgment concerning the Fate of Wounds.

XXIV. We have laid down theſe Principles, to guide Phyſicians in giving their Opinions in Courts of Juſtice, concerning the neceſſary Conſequences and Fate of Wounds. Although all Wounds ſhould be examined upon theſe Occaſions with great Circumſpection, yet none require more careful looking into than Wounds of that Claſs which are deſcribed under *N.* 22; becauſe there are great Diſſenſions amongſt the Learned upon this Head. Some are of Opinion that the Wounds mentioned at *N.* 22. are to be referred to the third Claſs, and ſo are to be reckoned mortal only by Accident, and by this Means they frequently acquit a Murderer. How they ſupport this Opinion I cannot tell; for my own Part, whenever I have found a Man loſe his Life by receiving a Wound in an Artery, at a Time of Night when a Surgeon could not be called, I have always determined that Wound to be mortal, and that the offending Part was guilty of the Murder. On the other hand, where a Wound of the ſame kind has been received in the Day-time, and the Patient has loſt his Life by the Neglect of the Byſtanders, in refuſing to call proper Aſſiſtance, or by the Ignorance of the Surgeon; in theſe Circumſtances I have always declared the Wound to have been mortal only *per accidens*, and have given my Opinion, that the accuſed Perſon ought to be acquitted, and the Surgeon indicted. But in order to form a proper

Judgment

Judgment in these cases, it is necessary that we should be well informed of all the Circumstances[a].

XXV. In very doubtful cases, to be sure, the mildest sentence ought to take place, according to the old saying, *It is better to let ten guilty persons escape, than to punish one innocent man*; for to be too rigid in these cases, will not only burden the Conscience of the Judge, but be also injurious to the Public. What is to be done in doubtful Cases.

XXVI. For the use of the younger Surgeons, I shall subjoin the Form which I always use in giving my opinion into Court, concerning the nature of a Wound. The Form of delivering in a Surgeon's Opinion.

" I the underwritten having this day diligently examined the dead Body of " A. B. in the Presence of C. D. E. *&c.* found it to have received the following " Wounds, that is to say, in the back part of the Body, under the right Shoul- " der, I discovered a Wound of the width of one Inch, through which I could " pass my Finger with great ease, between the Ribs, into the Cavity of the " Body; upon opening the Breast, almost the whole right Side was found full " of coagulated Blood, upon removing which I found a Wound also penetrat- " ing into the right Lobe of the Lungs, which not only pierced through this " Lobe, but also divided some of the larger Branches of the pulmonary Vessels, " with the *Bronchiæ* themselves; the Heart and all its Vessels were entirely " empty; no mischief appeared either in the Head or Abdomen. The effusion " of Blood which was occasioned by dividing the Vessels in the Lungs, could " not but bring on instant Death; therefore I hereby declare this Wound to " have been the Occasion of his Death, in testimony of the Truth whereof I " have hereto set my Hand."

N. N.

Done at the Day of
in the Year of our Lord

XXVII. Forms without number may be made from this by varying the Circumstances; but, above all things, I would advise the young Surgeon to be very Some general things with respect to these Forms.

[a] As an Example of this take the following Relation. In the year 1733, a Woman living in the Suburbs near *Brunswic*, walking out in the evening just before the Gates of the City were shut, received a Blow on the Head from a Man with a large Club, which laid her flat upon the Ground, and left her quite senseless; when the Fellow saw this he took to his Heels, and nobody was left near her, but her Husband and three small Children; the Man, frighten'd out of his wits, ran about to see if he could get people to assist him to carry his Wife home, (for she was a very large Woman) but the Night coming on he could prevail with no one, and the City Gates being shut, it was impossible to bring a Surgeon to her: the Woman therefore was left upon the ground all night without any assistance, and died the next Morning. When the Physicians and Surgeons came to examine her, they found a Fissure in the Cranium, and, upon raising the Scalp, they found a large quantity of extravasated Blood under the *Dura Mater*, lying upon the right lobe of the Brain, and therefore very judiciously determined it to be a mortal Wound. The Advocate for the Criminal opposed this Verdict, because there was no Surgeon called to treat her in a proper manner, by which she might possibly have been saved; upon this difference of opinions I was called upon to determine this matter. I declared as my opinion, that if the Woman had been within the City, where she might have had the assistance of Physicians and Surgeons, and had lost her life through their Neglect or Ignorance, then the Wound ought to have been deemed mortal *per accidens*; but, in the present case, it was impossible she should have had any such assistance, therefore her Death was occasioned by the Blow she received, and the Wound ought to be judged mortal *per se*.

careful in examining the ſtate not only of the wounded parts, but alſo of the contents of the Cranium and Abdomen, that he may obſerve whether any thing preternatural has happened in either of thoſe Cavities. If any one is deſirous of being more thoroughly inſtructed in the method of examining the Bodies of murdered Perſons, and in the proper forms of making a report, let him conſult a *French* Treatiſe upon this Subject, entituled, *L'Art de faire rapport en Chirurgie.*

The Cure of WOUNDS.

Cure of Wounds.

XXVIII. Since a Wound is a Solution of the Continuity of the parts of the Body, the Reunion of thoſe parts ſeems to be the principal Intention; but ſince Wounds are of very different kinds, ſome ſlight, and others of great conſequence, in proportion to this difference, ſo will the manner of proſecuting this Intention differ.

Cure of ſlight Wounds.

XXIX. The cure of ſlight Wounds is generally performed with great eaſe, by applying a ſmall portion of Lint to the part, well ſaturated *cum Spiritu Vini, Oleo Ovorum, Terebinthino, Oleo Hyperici, Linamento Arcæi, Balſamo Copaibæ, de Mechâ, Peruviano, &c.* ſecuring the dreſſings with a [a] Plaſter; the dreſſing ſhould be renewed once in a day or two, and the Lips of the Wound will preſently agglutinate; therefore in caſes of this kind a Surgeon is very rarely applied to.

Dangerous Woundshow to be treated.

XXX. Wounds which are attended with ſome danger are to be treated as follows: In the firſt place, the Wound is to be cleaned from all extravaſated Blood, Sordes, *&c.* in the next place, if a Bullet, the point of a Sword, any part of the Cloathing, a piece of Glaſs, or any other foreign Body ſhall remain in the Wound, it is to be removed with the Fingers, or with proper Inſtruments, as ſhall be explained more fully below. The Hæmorrhage is to be ſtopped at the firſt dreſſing, the divided parts are to be brought as near each other as poſſible, and their ſituation is to be ſo maintained, that the Cicatrix which is left may appear even.

1. Method uſed in cleanſing Wounds.

XXXI. Foreign bodies are removed from Wounds either by the Surgeon's Fingers, or by ſuch Inſtruments as we have deſcribed at *Plate* III. *Fig.* 3, 4, 5, 6, 7, 8. but where there are no extraneous bodies to be removed, the grumous Blood is to be wiped away with a ſoft Sponge, or ſome fine Lint, wrung out of hot Wine or Brandy; having done this, you are to proceed to ſtop the Hæmorrhage.

Method of extracting foreign Bodies.

XXXII. Before a Surgeon attempts the removal of extraneous bodies from a Wound, it behoves him well to examine whether this is to be done inſtantly, or whether it is not beſt to wait for a more convenient time; for if the Patient is become extremely faint from the loſs of blood which he has already ſuſtained, it will be neceſſary here to ſtop the Hæmorrhage, and to endeavour in ſome meaſure to revive him with moderate draughts of warm Broths, white Wine Whey, or of ſome cordial Medicine; for if ſome ſuch precautions are not taken, the Patient may not unlikely die in the Operation. So where you have reaſon to apprehend, that in extracting the broken point of a Sword or Spear, you are in danger of wounding a large Blood-veſſel or Nerve, it is better to wait a little till the Patient comes to himſelf, or till the Wound is ſomewhat enlarged by the Suppuration of the Parts: All theſe Circumſtances will be well weighed by the prudent Surgeon.

[a] The Plaſters I chiefly uſe are *Emp. Diachyl. S. Diapalm.* or *Stypticum Crollii.*

XXXIII. Foreign

XXXIII. Foreign Bodies ſhould always be extracted from Wounds by the Hand if poſſible, and this ſhould be done with all the Expedition, Tenderneſs and Care that may be, taking great care not to wound the neighbouring parts; but if there are any Bodies that cannot be removed by the Hands, then you muſt have recourſe to ſuch *Forceps* as we have deſcribed in *Plate* III. *Fig.* 3, 4, and 5. The ſame aſſiſtances alſo we make uſe of in extracting Bullets, broken pieces of Steel, Glaſs, *&c.* We ſhall ſpeak more clearly of the method of extracting Bullets, when we come to treat of Gun-ſhot Wounds. Where the Wound is too narrow to admit of the extraction of a foreign body without lacerating the parts, it muſt be dilated with the Knife; the Extraction will admit of no delay, but for reaſons of great moment, (*N.* 32.) beſides, whilſt the Wound is recent, and the Lips of it not ſwelled, it will ſuffer leſs pain in handling; and the Patient, from a ſtrong deſire of living, will at this time endure more than afterwards, when he comes to reflect.

What Inſtruments are uſed in extracting bodies from Wounds.

XXXIV. The Wound being cleanſed from Blood, and all extraneous Bodies, and the Hæmorrhage ſtopped, it now becomes the buſineſs of the Surgeon to cloſe the Lips of the Wound, and to conſider what is proper to be done to keep them in that Situation, that the parts may ſpeedily unite. Different methods are uſed in proſecuting this Intention, according as Wounds differ in their Conſequences, and in the number and degree of Symptoms attending them.

II. Of uniting dangerous Wounds.

XXXV. Amongſt the number of the moſt ſimple Wounds, we reckon thoſe which are made by Puncture, or ſtabbing, upon the external parts, and not penetrating deep. In theſe Wounds, after the Blood has been ſtopped at the firſt dreſſing, by the application of dry Lint, the common digeſtive, or *Balſamum Arcæi*, is to be ſpread upon a pledgit, and applied once every day; or if the Diſcharge is but ſmall, every other day, covering the dreſſings with a Plaſter and Compreſs, and ſecuring the whole with a proper Bandage. At every dreſſing you ſhould be careful to remove every thing that will give way readily, the Pus, or Sanies is to be gently wiped off with fine Rags. It may be remarked in general, that too frequent dreſſings do more harm than good, unleſs a more than ordinary diſcharge of Matter requires it: The truth of this is atteſted by CÆSAR MAGATUS, in his book *de rarâ Vulnerum Deligatione*, by *Belloſte* in his *Hoſpital Surgeon*, and others amongſt the Moderns, not to mention my own Experience upon this head. The firſt dreſſings that are applied, eſpecially where there has been a Flux of Blood, ſhould by no means be removed forcibly, but be left till they fall off of themſelves, which they will do when the Suppuration is formed; by this means much Pain, and perhaps a freſh Hæmorrhage may be avoided. But when a punctured or ſtabbed Wound penetrates very deep, the Cure is attended with many difficulties, eſpecially if it is made perpendicularly down, and has no depending Orifice; for in this caſe the Blood and Matter are eaſily collected at the bottom, and protract the Cure, and frequently form Fiſtulæ: To prevent theſe conſequences, it will be proper to preſs the Wound from the bottom upwards; to apply a Compreſs towards the Fundus of the Wound externally, and to apply what is called the *expelling Bandage* over all, which preſſes much tighter upon the lower than the upper parts.

Method of treating a Puncture.

XXXVI. But if all this precaution ſhould prove of no effect, which is frequently the caſe, it will be beſt to make a large opening at the bottom of the Wound before any Fiſtulæ are formed. In order to make this opening to the

A new Opening is frequently required.

greater advantage, it will be proper to get a particular ſort of Probe or Needle, very blunt at top, as at the *Letter* A. but at the other end provided with a large Eye or Hole through which a Linen Rag may be paſſed, (*See Plate* V. *Fig.* I.) This probe is to be paſſed to the bottom of the Wound, and the blunt part of it preſſed outwards towards the Skin, till you can feel it with your Finger; when you have felt it, cut down upon it, if you can ſafely, and make a large opening; ſpread the Rag that you have run through the eye of this Probe with ſome vulnerary Balſam, and draw it through the Wound after the manner of a Seton, and leave it there, dreſſing up both the Orifices with the ſame Balſam, covering the dreſſings with Plaſters and proper Bandages. In every ſucceeding dreſſing, the part of the Rag that is left out of the Wound is to be ſpread with freſh ointment, and the lower part drawn down till this takes place; and this method is to be continued till the Wound is well cleanſed, the diſcharge greatly diminiſhed, and all in a readineſs to heal; the Seton is then to be removed, and the Wounds healed as uſual.

Another Method of doing it.

XXXVII. GARENGEOT deſcribes a triangular Inſtrument invented by PETIT for this purpoſe, which the *French* call [a] *Troicar:* With this he makes an opening at the bottom of the Fiſtula, and introduces a Rag, which is paſſed through the Eye of this Inſtrument, and then through the Wound or Fiſtula, *See Plate* IV. *Fig.* 1. but as this Inſtrument is ſtrait, and I have frequently met with caſes where that Form would not anſwer the purpoſe, therefore I invented another, long before GARENGEOT's book came out, for the uſe of a Nobleman, who had a large Abſceſs in the fore part of the *Abdomen*, which opened near the Navel on the right Side, but penetrated as far as the Groin on the ſame Side. The Situation of the Crural Veſſels in this caſe, would by no means admit of a new opening, being made by a ſtrait Inſtrument; I invented therefore a crooked one, ſomewhat like the Inſtrument that is uſed to draw Water off in Hydropical Caſes, but longer, becauſe the Fiſtula was of a great length, (*See Table* IV. *Fig.* 2.) by the aſſiſtance of which, whilſt I directed the Apex towards the Skin, I eaſily made a new aperture, without endangering the Crural Veſſels; and that I might at the ſame time introduce the Seton, I contrived a Sulcus near the end, to which I faſtened a ſtrong Thread, and by drawing back the Inſtrument, I eaſily introduced the Seton through the Fiſtula; when the Seton was near all uſed, I ſewed new cloth to the old, and ſo introduced it through the Wound, cutting off the foul part, going on in this manner till the Wound was ſufficiently cleanſed, and ſo preventing the neceſſity of frequently introducing the Inſtrument.

Cautions concerning Healing.

XXXVIII. It is to be remarked here, that although, in ſome Wounds, it is no matter how ſoon you ſuffer the opening to heal; in this caſe, on the other hand, you muſt take great care that the Orifices are not healed before the bottom of the Wound; this may be done by the aſſiſtance of a Cloth ſomewhat twiſted, by the *French* called *Bourdonet*, or a ſhort ſoft Tent; but when it is healed from the bottom you may remove the Tent, and heal the Orifices. How Wounds of this kind, which penetrate into the Cavity of the Thorax or Abdomen, are to be treated, will be taught below in the V^th^ and X^th^ Chapters.

Method of treating a Cut.

XXXIX. Wounds, which are made by a cutting Inſtrument, where no part of the Fleſh is taken off, and the accident happens to the external parts of the Body,

[a] Traité des Inſtrumens, Tom. I. Pag. 391.

and

and does not penetrate deep, after they are cleanſed, ſhould be dreſſed with ſome [a] vulnerary Balſam, and the Lips of the Wound ſhould be cloſed and kept in that Situation; this is done after different Methods, according to the difference of the Wound. 1. This is to be obtained by *placing the wounded part in a proper Poſture*; as ſoon as the Wound is dreſſed, the Part ſhould be placed in ſuch a Situation, that the divided parts may be moſt likely to be in conſtant contact. 2. By *proper Bandage*; tying up the parts ſo that the Lips may meet, and ſo eaſily unite; this is attended with the greateſt Succeſs in Wounds that are made length-ways, for in this caſe the *uniting Bandage at Plate* II. *Lett.* F. anſwers the end completely. 3. By *a proper Suture*, which differs according to the difference of the Wound, but may be generally divided into the dry and bloody Suture; the *dry*, or, as ſome call it, the *baſtard Suture*, is the application of ſticking Plaſters to keep the Lips of the Wound united; the *bloody* or *true Suture*, is performing the ſame thing with a Needle and Thread.

What Wounds require a Suture.

XL. All Wounds are not to be united by the Needle; but thoſe only that are oblique, tranſverſe, or angular, and at the ſame time very large and deep; or in caſes where a part is near cut off, if a Wound is ſo circumſtanced, that it cannot be kept in a proper ſituation by Plaſters and Bandages. Wounds that are to be ſtitched ſhould be in their recent ſtate, and properly cleanſed from extravaſated Blood, and all extraneous Bodies; there ſhould be no loſs of Subſtance, except in thoſe fleſhy parts that are eaſily elongated; there ſhould be no Inflammation or Contuſion.

When, and in what manner the dry Suture is to be performed.

XLI. The dry Suture is to be uſed in ſlight Wounds, and eſpecially when they happen in the Face, and indeed wherever you think it is of force enough [b] to keep the Lips together; as it gives no freſh pain, and occaſions no ſcar, it is much fitter for Wounds of the Face than the Needle. The Plaſters which are to form the dry Suture ſhould be of a ſufficient Length, and ſhaped like the Part to which they are to be applied, ſo as to ſurround the greateſt part of it, but not the whole, leſt they ſhould retard the circulation of the Blood, and bring on Tumors and Miſchiefs of that kind; they muſt alſo ſtick very faſt, which purpoſe is excellently well anſwered by the *Emplaſtrum* ANDREÆ A CRUCE, *vel Stypticum* CROLLII, *vel Diachylum*, *vel Diapalmæ*, *Terebinthinâ probè ſubactum*. The Hæmorrhage being ſtopped, and the Wound well cleaned, ſome tenacious vulnerary Balſam, ſuch as *Eſſentia Maſtichis*, *Succini*, *Balſami Peruviani*; or the *Balſamum Præfecti Equitum Melitenſium*, which you will find deſcribed in LEMERII *Pharmacopœia Univerſalis*, under the Title of *Balſamum Equitis Sancti Victoris*. Theſe, and indeed all Balſams of the gummy kind, beſt anſwer the Intention in this place: For they preſently form a ſticky balſamic Cruſt, which denies all entrance to the Air, and preſently brings on the deſired union; but over this a ſticking Plaſter is to be laid, adapted to the ſize of the Part; you may apply two or more, according as you ſee occaſion, leav-

[a] Beſides the Medicines which we have recommended above, at N. XXIX. we may add here *Eſſentia Succini*, *Terebinthina*, *Maſtichis*, *Myrrha & Aloës*, *Gemmarum Populi*, *&c.* We muſt obſerve too, that where a contuſion is added to the Wound, which is the caſe in Wounds made by Glaſs, Saws, *&c.* the mildeſt vulnerary Oils and Balſams are to be applied, as *Ung. Digeſtivum*, or *Balſam. Arcæi*; but in thoſe made by Knives, Swords, *&c.* the Eſſences and Balſams which we have juſt deſcribed, are to be preferred, as being more aſtringent and drying.

[b] Where the Finger has been cut almoſt off, ſo as to hang by a piece of Skin, and the Surgeons have adviſed it to be taken off, I have cured it by this Suture frequently, and the Bones have united.

ing

ing a ſpace between; the manner of applying them you will ſee at *Plate* IV. *Fig.* 3, 4, 5. they are to be ſecured in their ſituation by the application of proper Bolſters and Bandages.

Other Methods of making the dry Suture.

XLII. According to PETIT's Method, the ſticking Plaſters ſhould have one, two, or more openings in the middle, *See Plate* II. *Fig.* 11. or in the manner of thoſe at *Plate* IV. *Fig.* 7. that you may diſcover through theſe, as by the ſpaces left between, in the former method, whether the Lips of the Wound were properly united or not; and that you may alſo be able to apply proper Remedies to the Part, without removing the Plaſters; theſe Plaſters are applied in the ſame manner as the former, and left on till the Work is completed. But the dry Suture may be formed alſo after another manner; to wit, make two Plaſters after the Preſcription of ANDREAS A CRUCE, ſpread upon ſtrong Cloth, anſwering in ſize to the Wound; to the ſides or margins of theſe faſten three or four tape ſtrings, according to the length of the Wound; and then, after warming the Plaſters, apply them on each ſide of the Wound, about the diſtance of a Finger's breadth from it, after the manner deſcribed at *Plate* IV. *Fig.* 8. After this bring the Lips of the Wound together, dreſs it up in the manner we have deſcribed above, and, whilſt an Aſſiſtant keeps the Lips of the Wound in their proper ſituation, let the Surgeon tie the ends of the tapes, firſt in a ſingle Knot, and then in a ſlip Knot, to keep the Parts in contact. Over each ſhould be laid an oblong Compreſs, and over all of them a large ſquare one, the whole to be bound up with a proper Bandage; on the next day the Wound is to be examined, and if the tapes are looſened they muſt be drawn tighter again; but if they are not looſened, let them remain untouched, only moiſten the Parts with a few drops of Balſam, covering them up again with the Compreſſes and Bandage as before. Some, in the room of tape, uſe claſps made of Steel or Braſs, as we have deſcribed them at *Plate* IV. *Fig.* 9, *and* 10. but this method is leſs convenient than the former, and therefore in very little uſe.

The bloody Suture what?

XLIII. In large Wounds, eſpecially tranſverſe ones, as their Lips cannot be maintained in their Situation by the dry Suture, which is frequently the caſe in Wounds of the Thigh, as you may ſee at *Plate* III. *Fig.* 1. *Letter* H. or in the Abdomen, Nates, or Arms; or where pieces hang from the wounded Part, as in the Forehead, Cheeks, Noſe, or Ears; or when large Wounds are made in an angular or cruciform manner, as at *Plate* IV. *Fig.* 12, 13, 17. here you muſt uſe the Needle, which Operation is called the *bloody*, or *true Suture*. The true Suture is diſtinguiſhed again into the *ſimple* and *compound*: The *ſimple Suture* is that which is performed only by the aſſiſtance of the Needle and Thread; to this Claſs belong the *interrupted Suture*, the *Glover's Suture*, and the *twiſted Suture*; the laſt is ſeldom uſed but in the Hare Lip, the ſecond only in Wounds of the Inteſtines, under which Head we ſhall treat of it more largely; but the firſt is in common uſe for all Wounds that require the true Suture, therefore we ſhall begin with the deſcription of that before the reſt. The *compound Suture* is that which requires other aſſiſtances beſides the Needle and Thread. Of that below.

How to perform the interrupted Suture.

XLIV. The beſt method of making the *interrupted Suture* I take to be the following one; take a double Thread well waxed, paſs it through a ſtrong crooked Needle; when the Lips of the Wound are brought together, and held firm in that ſituation by an Aſſiſtant, with one Stroke pierce through them both, paſſing your Needle through the lower Lip from without inwards almoſt to the bottom,

bottom, and ſo on from within outwards, obſerving to make the Punctures at a Finger's breadth from the Wound, (which in this caſe we will ſuppoſe to be in length two Fingers) varying this according to the ſize of the Wound; after taking off the Needle, tie the ends of the Thread, firſt in a ſingle Knot, and then in a ſlip Knot, covering all with the Dreſſings which we preſcribed in the dry Suture; but if the Wound is of ſuch a Length, that one ſtitch will not be ſufficient, then you may make two, three, or more, after the ſame manner that we have now deſcribed, always obſerving a Finger's breadth diſtance between each ſtitch, *See Plate* IV. *Fig.* 11, *and* 15. but to prevent the Knots from bringing on any miſchief, lay a ſmall Linen Compreſs (*See Plate* II. *Fig.* 22.) over the ſingle Knot, and make the ſlip Knot over that, which, if any Pain or Inflammation ſhould ſucceed, may be eaſily looſened.

Some Cautions.

XLV. We proceed in this manner in oblique or tranſverſe Wounds; but where there are Angles, as in a triangular Wound, *Plate* IV. *Fig.* 13. you are to proceed in the ſame manner as before, only the Suture muſt begin at the Angle A; then the Sides of the Wound muſt be ſtitched about the middle at B and C. If the Wound is quadrangular, or has two Angles like the *Greek* Letter Π, which ſometimes happens in the Face, *See Plate* IV. *Fig.* 14. then the Sutures muſt be made in both the Angles AA; but when the Wound is ſo large, that theſe are not ſufficient, then as many more as are neceſſary muſt be made in the middle way between the Angles BB. When you meet with a cruciform Wound, as at *Fig.* 6, *and* 12. and the Lips of it cannot be kept in contact by the uſe of Plaſters, the Needle, as at *Fig.* 12. muſt be paſſed in at A, and come out again at B; it muſt enter again at C, and come out again at D; the extremities of the Threads muſt then be tied in the manner we have before directed, between A and D. How the Wounds are to be treated afterwards, we ſhall explain below.

The compound Suture.

XLVI. Some of the Surgeons amongſt the Ancients uſed a *compound* Suture for large Wounds, in the room of the interrupted Suture; and they preferred this, becauſe it prevented the Lips of the Wound from being lacerated, which ſometimes happened when the other method was uſed, which not only prevented the Wound from uniting, but frequently brought on other grievous Diſorders; and though this Method has of late years been rejected, and particularly by DIONIS in his Surgery, yet it is not at this day without its [a] Advocates, who highly commend it, and prefer it to the interrupted Suture in many Caſes; but they uſe it with this difference, that, inſtead of two pieces of Wood, they uſe pieces of Plaſter rolled up in a cylindrical Form, of the length of the Wound, and about the ſize of a Gooſe Quill, from whence it is by ſome called the Quilled Suture; this Method prevents Tumors, Pain and Inflammations, that might be brought on by the Hardneſs and Preſſure of Wood: PALFYNUS performs this Operation, in deep Wounds of the muſcular Parts, with a large, ſtrong, crooked Needle, furniſhed with a ſtrong double Thread well waxed, (*See Plate* IV. *Fig.* 15.) which makes a bow at one end; the Needle being paſſed through both Lips of the Wound in the manner we have before deſcribed, and a ſecond and a third paſſed in the ſame manner as is ſhewn at *Fig.* 17. a Roll of Plaſter is to be introduced into the bow ends of the Thread, which are left hanging out at BB; then when

[a] As PALFYNUS, in Chirurgia, Chap. VI. de Suturis; and ſince, GARENGEOT in Chirurg. Cap. de Suturis.

the

the Needle is taken off at the other ſide, another Roll is to be placed between the ends of the Thread, and the Lips of the Wound being brought together, theſe ends are to be gently tied over the Roll, firſt in a ſingle, and then in a ſlip Knot, as at CCC. If there are three Threads, you are to tie the middle firſt, and then the reſt, treating the Wound afterwards as we ſhall ſhew below.

Another Method by GARENGEOT.

XLVII. GARENGEOT performed this Operation much after the ſame Method we have juſt deſcribed, (*See his Book of Operations in Surgery, Chap. 3. on Sutures*) but with this difference, inſtead of a double Thread, he made ſmall Ligatures of ſix or eight Threads (according to the ſize of the Wound) joined together and waxed, always obſerving not to make it ſo big, that when it ſhould be doubled it ſhould exceed the ſize of the Needle, leſt it ſhould create Pain, by not paſſing readily after the Needle. When a ſufficient number of theſe Ligatures are paſſed through the Lips of the Wound, he makes a Knot upon each of the ends that hang out of the upper Lip, and then unravels the Threads that compoſe the Ligature, between the Knot and the Lip of the Wound, and by this means forms a Paſſage, through which he can introduce the cylindrical Roll of Plaſter; after this he claps two Fingers upon the lower Lip of the Wound, near the Punctures which were made by the Needle, and with the other hand draws back the Ligature gently, beginning in the middle, if there are more than two, till the Wound is exactly cloſed; then he divides the Threads of each Ligature into [a] two Parts, with which he ties the other Roll as before, nicely joining again the Lips of the Wound; in tying theſe ends, great care ſhould be taken not to make the Knots too tight at firſt, leſt they ſhould bring on Pain and Inflammation. The Wound is now to be covered with vulnerary Balſams ſpread on Lint, but eſpecially with the *Balſamum Præfecti Equitum Melitenſium*, which I have commended before, adding to this a Compreſs and proper Bandage.

What is further to be obſerved.

XLVIII. On the firſt days, after whatever Method the Suture is performed, the Bandage and Compreſs are to be gently removed, and the ſtate of the Wound examined; if every thing looks well, and there is little or no Pain or Inflammation, the Sutures are to be let alone for ſix or ſeven days, or longer, and the Wound be dreſſed up again as before, till it appears that there is a ſtrict union procured; but if the ſtitches ſhould appear to be too looſe, the Knots ſhould be tightened; if they are too tight, they muſt be looſened a little. When the Lips of the Wound appear to be enlarged or bruiſed, they ſhould be dreſſed with a digeſtive Ointment, or with the *Balſamum Arcæi*, the continuance of which will preſently remove all theſe Symptoms; but when the Wound is attended with great Inflammation and Fever, the ſtitches ſhould be ſomewhat looſened, the Patient ſhould be let Blood, and live upon a thin Diet, and the Body ſhould be kept open. Theſe Symptoms being removed, the ſtitches ſhould be again tightened by degrees, and the Wound dreſſed as above; but if theſe applications ſhould prove fruitleſs, and the complaints ſhould increaſe, ſo as to threaten danger, the ſtitches muſt be cut, and the Wound treated as if there was a loſs of Subſtance; which method we ſhall explain below.

[a] *Garengeot* here orders them to be ſeparated into three Parts; but what uſe he puts the third Part to I can't comprehend; I am apt therefore to imagine that there is ſome Omiſſion in this Place.

XLIX. On

XLIX. On the other hand, if the Wound heals by the aſſiſtance of the Suture, which you will be ſure of, not only from obſerving the Lips of the Wound to lie cloſe together and unite, but by the relaxation of the Threads or Ligature upon the diſordered Part; the Threads or Ligatures are to be cut near the Knots with Sciſſors, the lower Lip of the Wound is to be ſuſpended with one hand, whilſt the Threads are gently drawn out with the other; the Punctures that are left will eaſily heal by the application of a vulnerary Water, called by the *French* *l'Eau d'Arquebuſade*, or by injecting *Aqua Calcis*, or *Spiritus Vini*, and laying on Compreſſes dipped in the ſame Liquors; but larger Wounds are to be dreſſed with one of the before-mentioned Balſams, and the Lips kept firm together with ſome ſticking Plaſter, till a firm Cicatrix is formed. What is to be done after the Wound is healed.

L. Where there is loſs of Subſtance the Wound will not unite either by the help of Plaſters or Suture, till it is filled up with new Fleſh: For this purpoſe you will find Lint dipt in Oil, or ſpread with ſome vulnerary Ointment or Balſam, and applied to the bottom of the Wound, very ſerviceable, covering it with a Plaſter, Compreſs, and proper Bandages. This dreſſing is to be repeated daily; though it is a very vulgar error, to ſuppoſe that theſe applications generate Fleſh, which is produced by the circulating Fluids, which in a wonderful manner are continually bringing ſomething new to the wounded Parts; though it muſt be owned that Medicines of this ſort conduce very much to the generation of new Fleſh, and to remove every thing that might hinder that end; therefore it is no wonder they are called *ſarcotic Medicines*. There ought to be a balſamic and emollient quality in theſe Medicines, that they may not only reſiſt Putrefaction, but may alſo ſoften the young Fleſh, ſo that it may eaſily receive additions from the Blood, and ſuffer itſelf to be elongated; of this kind are the Oils, Balſams and Ointments, which we took notice of at *N.* 35, *and* 29. Of healing Wounds where there is loſt of Subſtance.

LI. As hot or cold air is very hurtful to Wounds, ſo it muſt by all means be kept from them: For nothing will ſooner corrupt the Juices, or ſhorten and dry up the Veſſels, and hinder the growth of new Fleſh, than the Air. In order to prevent inconveniences from this cauſe, the Surgeon ſhould be careful not to remove the old Dreſſings till the freſh ones are got ready, and to be as expeditious as poſſible in applying them. How the Air is to be kept from Wounds.

LII. After this, when a white, even thick matter appears in the Wound, the Wound ſhould be dreſſed as you ſhall ſee occaſion; every day, or every other day, the ſuperfluous matter ſhould be wiped away with a very light hand, and it's better to leave ſome behind than to treat the Wound roughly; for wiping the Wound roughly hinders the growth of new Fleſh, but a little matter being left, performs the office of Oil or Balſam, keeping the Parts moiſt. Theſe Rules being obſerved, new Fleſh will preſently ſpring up, and the Wound unite. How the Wound ſhould be entirely healed.

LIII. But that nothing may be omitted which may ſeem neceſſary towards the perfect Cure of the Wound, the Surgeon ought to be induſtrious to procure an even Cicatrix; to this end it will be proper to dry by degrees, and to harden the ſurface of the new Fleſh, by the application of dry Lint, covered with a tight Bandage; but when this is not ſufficient, it may be proper to uſe ſome of the drying Eſſences, or native Balſams at *N.* 39. or drying Powders, ſuch as *Tutia*, *Lapis Calaminaris*, *Maſtiches*, or *Colophonium*. Rectified Spirit of Wine is frequently uſed for this purpoſe with great advantage; which carries a great aſtringent and drying virtue with it. How a Cicatrix is to be formed.

How foul Wounds are to be treated.

LIV. When you perceive any uncleanneſs or foulneſs in a Wound, that is, if the Fleſh is putrid, fungous, black, livid, it muſt be well cleanſed before you attempt to heal. Different methods have been propoſed to execute this Intention; the Ancients uſed Honey in this caſe, *See* CELSUS, *Lib.* V. *Cap.* 26. *N.* 22. but the Moderns apply a digeſtive Ointment made *ex Terebinthinâ Vitell. Ov. q. s. ſubactâ cum Mell. Roſar. q. v. admiſt.* but where this is not ſtrong enough for their purpoſe, they ſubſtitute *Unguentum Ægyptiacum, vel Vini Spiritu dilutum, vel digeſtivo admiſtum.* Some in the room of this uſe *Unguentum Fuſcum Wurtzii.* To theſe digeſtive Ointments you may very properly add a ſmall quantity of *Aloës* or *Myrrh*, or, if you require ſtill more ſtrength, *Mercurius præcipitatus ruber*; but the uſe of *Aqua Calcis* is well known to be very beneficial as a Detergent, eſpecially if you add to a Pint of this *Mercurii ſublimati Gr.* xx, *vel* xxx. which, from its known efficacy for this Intention, is called by the Surgeons *Aqua Phagædenica.* Applications of this kind are to be continued till the Wound is entirely clean, and then you are to have recourſe to the methods preſcribed at *N.* 50.

Howfungous Fleſh is to be taken down.

LV. If the new Fleſh ſhould be luxuriant, and riſe up ſo as to prevent the formation of an even Cicatrix, it muſt be taken down *cum Vitriolo Cæruleo*, or in the room of this you may uſe a Powder compoſed *ex Alumine uſto, Mercurioque rubro præcipitato*; at the ſame time making a proper Preſſure with the Plaſters, Compreſſes and Bandages, till the Parts are even.

Rules to be obſerved by the Patient.

LVI. The Patient ſhould obſerve a ſtrict Regimen, with regard to his Diet and way of Life: For nothing forwards the Cure ſo much as a good habit of body, which may be procured by obſerving a ſtrict regularity with regard to Diet, conſulting which is the moſt proper Air to live in, keeping the Paſſions under, and neither indulging in too much Sleep, nor ſuffering too great Watchfulneſs. The greater tendency there is in a Patient to a diſeaſed ſtate of Body, ſo much the ſtricter courſe of life ought he to obſerve.

What Air is beſt.

LVII. As to the Air, it ought to be temperate, and the Chamber ſhould be equally guarded from Exceſſes either of Heat or Cold; for this regulation is of conſequence in all Wounds, but moſt wonderfully ſo in thoſe of the Head. If the Patient is in any danger of ſuffering from the dampneſs of his ſituation, it will be very proper to burn Amber, Frankincenſe, and Maſtick round him, to dry the Chamber.

What Diet is beſt.

LVIII. All Intemperance in eating and drinking is moſt diligently to be avoided; that ſort of Food is beſt which is moſt readily digeſted, for it makes a thin light Chyle, and good Blood, which wonderfully aſſiſts the Wound in healing. For this Intention various ſorts of broths may be recommended to the Patient, particularly thoſe that are made *ex Hordeo, Avenâ, Mannâ, Oryzâ, Scorzonerâ, Lactucâ, Endiviâ, Chærophyllo, Petroſelino, Cichoreo, Aſparago.* He may eat Veal or Lamb, Pullets or Capons, Ale thickened with the Yolks of Eggs, ripe Fruits, particularly Apples, Cherries or Plumbs; Vegetables alſo of ſeveral ſorts well boiled, to wit, *Spinachia, Lupulus, Aſparagi, Cinaræ, Lactucæ*, and moſt Pot-herbs: But Perſons of ſtrong athletic Conſtitutions, that cannot be ſatisfied with Diet of this kind, may be indulged in a more nouriſhing Diet, if they are attended with no violent Symptoms; but wherever there is any degree of Inflammation, the Patient muſt entirely abſtain from Fleſh, and all ſolid Food. Wounded Perſons ſhould conſtantly avoid admitting any thing *ſharp, ſalt,*

ſalt, or *ſpicy* into their Diet; for they give a ſharpneſs to the Blood, and increaſe its Heat and Motion, and conſequently occaſion Hæmorrhages, Fevers and Inflammations. They ſhould therefore abſtain from every thing that is ſeaſoned, from Muſtard, Horſe Radiſh, and Onions. *All Meats that are difficult to digeſt, and breed a thick Blood*, ſhould alſo be denied; ſuch are all fat Meats, Lard, Bacon, Geeſe, Beef, either ſalted or cured in the Smoke, Peaſe, Beans and Lentils, eſpecially after they are dried, and all things of this kind.

What Drink is beſt.

LIX. The Patient's *common Drink* ſhould never be ſtrong, therefore he ſhould be forbid the uſe of Wine, ſpirituous Liquors, Mead, ſtrong Beer, *&c.* The ſmaller his drink is, by ſo much is it the wholſomer; but in this caſe we muſt always have a regard to the Conſtitution and Cuſtom of the Patient, and the nature of the Wound; ſo when he has been uſed to drink Water, he may go on in the conſtant uſe of it, or drink in its ſtead a Ptiſan made of a decoction of Bread or Barley mixed with Liquorice, Aniſeed, Fennel, or Citron Peel. Thoſe who diſlike Water may be indulged in good ſmall Beer, that is neither too new nor too ſtale; but if the Patient is in great danger, and of a weak habit of body, you may preſcribe him a particular *vulnerary Drink*, to correct the vitiated Fluids; but of theſe we ſhall treat more largely below at *N.* 63, *and* 64.

Of Reſt, Motion, Watchfulneſs, and Sleep.

LX. The beſt remedy for a wounded Perſon is *Reſt*, therefore he ſhould be indulged in it, eſpecially with regard to the lower Limbs; for to walk, or even to move, is very pernicious; there are many inſtances of wounded Perſons who have not only ſuffered grievous Injuries, but even Death itſelf, by violent motions of the Body. Nor is too great Watchfulneſs of leſs conſequence to the Patient; therefore, if Nature denies neceſſary Reſt, it muſt be procured by the aſſiſtance of Medicines. To anſwer this Intention you may very properly preſcribe *Syrupi Papaveris albi* ℥ß *ad* ℥i. *ex Aq. Primulæ veris, vel Ceraſorum nigror. vel ex Emulſione Papaveris Semine & Amygdalis dulcibus confecta.* When this appears to be too weak for the deſired end, you may give *Theriaca Venet. vel Confectio Mithridatii ad* ʒi. *vel* ʒii. *vel Opii puri Gr.* i. in one of the Vehicles we mentioned above.

The Bowels ſhould be kept open.

LXI. *The Bowels ſhould by all means be kept open*, eſpecially in thoſe who have received a Wound in the Head: For they are ſubject to great heat of Body, and are very apt to be bound; but obſerve in this place, that ſtrong cathartic Medicines are to be avoided, for in ſo weak a ſtate of Health they are of very ill conſequence; but it is not only ſafe but adviſeable to eat and drink thoſe things, that may at the ſame time nouriſh and keep open the Body: To this end the Patient may drink plentifully of *Tea* or *Coffee*, or may eat ſtewed Prunes, roaſted Apples alſo may be eaten for the ſame purpoſe; but hard Meats of all kinds are to be forbid. Where the Patient is ſo bound up, that a Diet of this kind has no effect upon him, it will be neceſſary to have recourſe to Medicines, but to thoſe of the mildeſt kind: you may here give a gentle Clyſter, or uſe a Suppoſitory, or preſcribe a Solution of an Ounce or two of *Manna, or ſome purging Salts*, in warm Broth.

The Mind ſhould be free from Care.

LXII. *Violent Paſſions of the Mind*; ſuch as Anger, Fear, Sorrow, and particularly Luſt, ſhould diligently be avoided, and a quiet, ſerene, eaſy, chearful ſtate of mind preſerved; the contrary of which will never fail to bring on dangerous Symptoms.

What internal Medicines are to be given.

LXIII. Whenever the Violence of the Wound, or the ill habit of the Patient, require the uſe of *internal Remedies*, vulnerary Drinks will be found to be of the greateſt conſequence in this place; in compoſing of which, the conſtitution of the Patient, and the nature of the Complaint ſhould be diligently conſulted; for they are in a great Error, who, according to the cuſtom of common Surgeons, give one kind of vulnerary Potion for all ſorts of Wounds, and in all habits of Body: For if your Patient is of a phlegmatic habit of Body, cold, pale, naturally ſubject to Tumors, then the vulnerary Decoction ſhould be compoſed of Herbs that will attenuate and divide the Blood, ſuch as the *Radices quinque aperientes, Rad. Caryophyllat. Fœnicul. Gramin. &c. Herb. Sanicul. Alchymyll. Agrimon. Betonic. Veronic. Piloſellæ, Pervinc. Virgæ Aureæ, Sophiæ Chirurgorum, Semen Aniſi, Fœnicul. Dauci, &c.* The Drink is preſcribed in the following manner; take two or three handfuls of any of the before-mentioned Ingredients, boil them gently for a few Moments in ſix pints of Water, ſtrain it, and ſweeten it with ſome proper Syrup, ſuch as the *Syrupus Capill. Ven. Rad. quinque aperient. &c.* give a draught of this three or four times in a day. You may alſo give Infuſions of the ſame Herbs made after the manner of Tea, and ſweetened with Sugar.

Vulnerary Drinks for a thin ſharp Blood.

LXIV. Some Perſons have a thin, ſharp Bloop; in this caſe it will be proper to adviſe Decoctions of viſcous glutinous Plants, ſuch as the *Rad. Symphit. Liquirit. Polypod. Scorzoner. Sarſaparill. Herb. Malv. Althææ, Verbaſc. Parietar. Mercurial. Flor. Malv. althææ, Verbaſc. Dactyli, Ficus, Jujubæ*, which may be prepared in the manner we have juſt deſcribed; but if the Patient is vexed with great Pain or Wakefulneſs, then, beſides the methods which we lay down at *Chap.* II. to alleviate Pain, you may give an Ounce or two of the *Syrupus Papaveris albi vel de Meconio*, mixed with the before-mentioned vulnerary Drink, or with Emulſions *ex Amygdalis & papavere albo.*

Remedies againſt Acrimony and Heat.

LXV. If the Patient ſhould be troubled with any Acidity, you may give him Powders every day *ex Lapid. Cancrorum, vel ex Matre Perlarum, vel ex Conchis præparatis*, or any other Abſorbents; but when you perceive a quickneſs of Pulſe, and an extraordinary Heat, they are ſure ſigns of a ſymptomatical Fever; to relieve or take off which, the following Remedies will be found of ſervice; give Barley Water with the addition of ſome Tamarinds, and *Syrupus Mali Citrei vel Ribeſiorum*, or ſome of the Powders mentioned above, with the addition of a ſmall quantity of Nitre; but in this place it will be very proper for the Patient to loſe ſome Blood, more particularly if he is young and full of Blood, or if the Pulſe is ſtrong and hard: But in theſe circumſtances a *Phyſician* is more proper to be conſulted than a *Surgeon.* What has here been ſaid with regard to the Regimen which is to be obſerved by the Patient, as well with reſpect to Diet as Medicine, I think is ſufficient, and I heartily recommend the Obſervance of theſe Rules to all wounded Perſons, but more particularly to thoſe who are to undergo ſevere Operations in Surgery, ſuch as Trepanning, Lithotomy, Extirpation of the Breaſt, Amputation of a Limb, or large Tumor. Whenever we ſhall have occaſion below to ſpeak of the regularity that Patients ought to obſerve in their Diet, I hope the Reader will endeavour to recollect what has been ſaid upon that head, that we may not be obliged to make tedious repetitions.

CHAP.

CHAP. II.

Of the Diſorders accompanying WOUNDS, *commonly called the Symptoms of* WOUNDS.

I. *Of an Hæmorrhage.*

I. PROFUSIONS of Blood attending Wounds, all ariſe from Injuries of the Veins or Arteries: The violence of the Hæmorrhage will be in proportion to the ſize of the wounded Veſſel; whoever conſiders this, will no longer wonder at the dreadful conſequences attending this Symptom, ſuch as great Weakneſs, fainting Fits, and ſometimes inſtant Death; no Surgeon therefore ought to be without a preſent Remedy to ſtop Blood: Though there are ſome caſes where it is by no means proper to reſtrain the Hæmorrhage inſtantly; for in a young, Plethoric Habit, or where the Wound has been received in a drunken fit, or in a fit of Paſſion, it is beſt to let the Blood run, as long as it continues to do ſo without bringing on any Inconvenience upon the Patient; for by a moderate loſs of Blood, the Inflammation, Tumor, Pain and Fever are prevented, or much leſſened. An Hæmorrhage how to be ſtopped.

II. There are various methods propoſed to ſtop an Hæmorrhage; if none of the larger Veſſels are wounded, you have your remedy at hand, to wit, *dry Lint*, which you are to fill the Wound with pretty cloſely, covering it over with large Compreſſes, and making a proper degree of Preſſure over all with Bandage, and with your Hands; for more ſervice is frequently done in this caſe by making a proper Preſſure upon the Part with the Dreſſings, and with your Hands, than could be effected by more violent Remedies. 1. By dry Lint.

III. But if the Hæmorrhage is too large to be ſtopped by the application of dry Lint, then *aſtringent Medicines* are to be called into uſe: With this intention the Ancients applied Rags to the Wound, which were dipped in cold Water or Vinegar, and covered them with Compreſſes wet with the ſame Liquors. Amongſt the Surgeons of later date, a certain Fungus called *Lycoperdon*, or vulgarly *Lupi Crepitus*, has been highly extolled for this purpoſe: The Wound is filled with this in the room of dry Lint, and afterwards dreſſed up in the ſame manner as we directed above. The moſt common Remedy at preſent is *Spirit of Wine highly rectified*; this is applied cold to the Wound, filling it up with doſſils dipped in the ſame Spirit, and covering it with large Compreſſes wrung out of the ſame Liquor, making a proper Preſſure over all with the Bandage: The ſame virtues uſed to be aſcribed to *Oil and Spirit of Turpentine*, applied in the ſame manner as the Spirit of Wine. To this end alſo ſtrong Solutions of *Alum*, *Vitriol*, or *Saccharum Saturni in Aqua Plantaginis*, were recommended by many. Some diſſolved Alum and the Vitriol together in the ſame Water, or, where they would have it of more force, in Phlegm of Vitriol: Others make a ſtyptic Liquor *ex Vitriol. Alb.* ℥i, *& Aceti fortiſſimi* ℥iii, applying it in the foregoing manner. In this place we are by no means to omit the mention of *aſtringent Powders*; ſuch as are made *ex Bolo Armena*, *Lapide Hæmatite*, *Sanguine Draconis*, *Croco Martis aſtringente*, *Terrâ Japonicâ*, *Aloë*, *Olibano*, *Maſtiche*, *Granat. Corticibus*, *Alumine*, *Saccharo Saturni*, *Terrâ Vitrioli dulci*, *Gypſo*, *Hepate Vitulino toſto*, and ſeveral 2. By aſtringent Medicines.

ſeveral other Medicines of this kind, either alone or mixed in different Proportions, and ſprinkled plentifully upon the Wounds, dreſſing them up with Lint, Compreſſes and Bandages, as above.

3. By cauſtic Medicines. IV. When Veſſels of a larger ſize are divided, it is uſual to apply *cauſtic Medicines*, which act by their great Aſtringency; the Medicine chiefly uſed with this Intention, and indeed the ſafeſt, is *Vitriolum Romanum*, which being coarſely powdered and ſprinkled upon Cotton, is eaſily applied to the Wound, dreſſing up with Doſſils, Compreſſes and Bandage: The *Liquor Stypticus Weberi* is alſo uſed here, and others of the like kind, which have Oil of Vitriol in their compoſition; but thoſe Dreſſings only which are applied to the bottom of the Wound are to convey theſe Medicines, otherwiſe the neighbouring Parts would ſuffer too great Corroſion. Thoſe Medicines which are endued with a ſtronger cauſtic quality than theſe, ſuch as *Mercurius Sublimatus*, *Lapis Cauſticus*, *Oleum Vitrioli*, *&c.* can never be uſed with ſafety, becauſe they are conſtantly attended with violent Symptoms.

4. By dividing the Arteries. V. But if theſe applications prove fruitleſs, it will be proper to *divide entirely the Arteries which are only divided in part*, and occaſion the Hæmorrhage; for by this means they will contract and hide themſelves under the muſcular Fleſh, and the Orifices will be choaked up, at leaſt they will more readily yield to the Force of the Medicines recited above. This method of Treatment is principally neceſſary in Wounds of the temporal Arteries, and of thoſe of the Cubits and Tibiæ.

5. By the actual Cautery. VI. If this method ſhould alſo fail, you muſt have recourſe to the *actual Cautery*: The Orifices of the Veſſels being burned, a Cruſt is formed over them; and this method is ſo effectual, that it is ſcarce poſſible for an Hæmorrhage to happen in Wounds of the external Parts, but what may be ſtopped by it; you ſhould, in this caſe, always have two Cauteries ready, that if one ſhould be extinguiſhed before the Operation is finiſhed, you may be prepared with another. Cauteries are made of very different ſhapes and ſizes, according to the Parts to which they are to be applied: I have given you eight different ſorts for different uſes in *Plate* III. *Fig.* 9, *to* 16. There are two Inconveniences which generally attend the uſe of the Cautery, and ſometimes force us to neglect it; for firſt, not only the Patient is uſually wonderfully terrified at the apprehenſion of it, but Mankind in general look upon it as a piece of Barbarity to adviſe the uſe of it; when, to ſay truth, it does not occaſion ſuch violent Pains as are uſually apprehended from it, and what Pain there is in the Operation, is inſtantly over. But it is alſo attended with another Inconvenience of greater Conſequence, that is, the Eſchar which is brought on by the Cautery, frequently falls off in two or three days, from whence a freſh Hæmorrhage ſucceeds, and moſt likely a deadly one. To prevent this, two things are to be obſerved, firſt, to handle the Wounds tenderly at the time of dreſſing; and ſecondly, to be provided always with a freſh Cautery, to repeat the Operation if neceſſary. This caution is to be obſerved in the larger Arteries for fourteen days; after this, there is no great danger of a return of the Complaint; but where the crural, or axillary Arteries are wounded, the Cautery will be of no ſervice.

6. By Ligature. VII. In very dangerous Wounds of the large Arteries, ſuch as the crural and axillary, and in Amputations of the Limbs, the ſafeſt method is that of making a *Ligature* round the Veſſels: If this is performed by paſſing a ſtrong waxed Thread under

under the Artery by the help of a crooked Needle, the Blood is preſently ſtopped, and the Orifices of the Artery coaleſce.

VIII. Laſtly, ſeveral Inſtruments have been contrived to ſtop Hæmorrhages; formerly a large Iron ring, furniſhed with a Screw, was in great uſe amongſt the Surgeons, which they applied in ſuch a manner to the wounded Limbs, that by tightening the Screw which preſſed upon the Compreſſes, and other Dreſſings, it cloſed the mouths of the Veſſels, and ſtopped the Flux of Blood: You may ſee deſcriptions of this Inſtrument in *Scultetus*; but as this was a very inconvenient Inſtrument, and could only be applied to the Limbs, the Surgeons found themſelves under a neceſſity of inventing a more convenient Inſtrument, that might be applicable alſo to the Arteries of the Neck or Head. An Inſtrument of this kind you may ſee in *Plate* V. *at Fig.* 2. the conſtruction of which is as follows; a Braſs Plate of three Fingers in length, and two in breadth, AA is perforated in the middle to admit a ſtrong Screw, BB, which is provided at the lower end with a ſmall round Plate, C; a piece of Leather is ſtrongly faſtened to one end of the Braſs Plate, of equal breadth with it, EE, FF. In violent Hæmorrhages this Inſtrument is fitted to the wounded Part, and the End F is by means of Holes that are made in it, faſtened to the Hooks GG; ſo that the ſmall Plate C. may preſs exactly upon the Compreſſes and Dreſſings that cover the Wound: All things being thus prepared, the Handle of the Screw D is to be turned round gently till a ſufficient Preſſure is made to ſtop the Blood, and then it is to be left in that condition for a day or two; but it muſt be entirely left to the diſcretion of the Surgeon, when he ſhall think it prudent to alter the Poſition, or entirely to take off the Inſtrument. An Inſtrument of this kind, with a longer Belt, will ſerve in Wounds of the Head and Temples. 7. By Inſtruments.

IX. When we are ſpeaking of Inſtruments that are uſed to ſuppreſs Hæmorrhages, we muſt not omit the *Tournequet*, which we uſe with great ſucceſs after Amputations. There are ſeveral things required to form this properly: The firſt thing to be enquired after, is a ſmall Roller of a Thumb's breadth, and about a *Paris* Ell in length; in the next place, a little cylindrical Stick; then a conglomerated Bandage, two Fingers thick and four long; ſome Compreſſes of a good length, and about three or four Fingers in breadth, to ſurround the Legs or Arms. Laſtly, a ſquare piece of ſtrong Paper or Leather, about four Fingers wide. 8. By the *Tournequet*.

X. We are now acquainted with the nature of the *Tournequet*; it remains that we enquire which is the moſt convenient manner of applying it. The rolled Bandage is to be applied to the Trunk of the wounded Artery lengthways, covering it in a contrary direction with Compreſſes, ſurrounding the Leg, Foot, or Arm as it were with a Ring; the Roller muſt be paſſed twice round theſe applications, and faſtened in a Knot, but ſo looſely, that you may eaſily introduce your Hand between it and the injured Part; the Leather or thick Paper muſt be nicely placed under it upon the external Part of the Leg, and the Roller tightened by degrees, by turning the Stick round (which is to be introduced into the Knot) till the Hæmorrhage is entirely ſtopped: The Stick muſt be kept in this ſituation till the Wound is properly treated, and the return of the Hæmorrhage prevented by proper Remedies, or by taking off the Limb. When this end is acquired, the *Tournequet* is to be looſened, or entirely taken off, as the Surgeon ſhall think convenient; but where it is applied to the Arm, the How the *Tournequet* is to be applied.

rolled Bandage is to be placed near the *Axilla*, in the internal Part of the *Humerus*, and the Stick in this caſe is to be faſtened on the oppoſite ſide; the ſituation of the Artery requires this Poſition, *See Plate* III. *Fig.* 1. *Lett.* K. When the Hæmorrhage happens in the Thigh, the Bandage is to be applied to the upper part of the Thigh, or juſt over the Knee, as the circumſtances ſhall require, in the ſame manner as before, *See Lett.* L, M, N. but that you may have the clearer Idea of the Figure and Poſition of the *Tournequet*, we have given you a Draught of it at *Plate* III. *Fig.* 2.

PETIT's *Tournequet.*

XI. PETIT, a Surgeon of firſt rank in PARIS, invented another *Tournequet* in the room of this, which is well enough known by the name of the Inventor; it is ſaid to have this advantage over the other, that it will preſerve its ſituation without requiring the attendance of an Aſſiſtant; and beſides, that it may be left upon the Limb any given time, without impeding the Circulation of the Blood: Whereas the common one entirely interrupts the Circulation of the Blood, and therefore cannot be kept on long. The Deſcription that I have ſeen of it is ſo ſhort and imperfect, eſpecially as the Parts of which it is compoſed are not deſcribed ſeparately, that in many Places I could not underſtand it. GARENGEOT, *Tom.* II. *de Inſtrument. Chirurg.* differs a little in his Deſcription of it, but he is by no means clear.

Our Improvement upon it.

XII. Therefore I have taken ſome Pains to correct it, in the manner you may ſee at *Plate* V. *Fig.* 6. AA deſcribes the upper Part, BB the lower, and C the Screw; all in their natural ſize, made of ſome ſtrong Wood. At the extremity DD there are two ſmall Iron Screws, to which a ſtrong ſilk Roller is to be fixed, of the ſame width with the Inſtrument, but about twenty Fingers in length, that it may be long enough to encompaſs the largeſt Part of the Limbs, and be faſtened at the ſmall Hooks deſcribed at E: Both extremities at FF are to be hollowed, that the Roller may lie quiet and firm: G deſcribes an Iron Plate which is placed there to ſtrengthen the Wood. The Wound therefore being properly dreſſed up, and the lower Part of the *Tournequet* guarded with a Bolſter, is to be placed on the ſide oppoſite the Wound; the Silk Roller is to be brought round the Limb, and being drawn very tight, is to be fixed to the Hooks E, and then by turning the Screw C. till a ſufficient Preſſure is made upon the Parts to ſtop the Flux of Blood, it muſt be left upon the Limb in this ſituation, as long as the Surgeon ſhall deem it neceſſary.

MORAND's *Tournequet.*

XIII. GARENGEOT, in the ſecond Edition of his Book of Chirurgical Inſtruments, deſcribes another *Tournequet* invented by MORAND of *Paris*, of which he has given us a *Plate at Page* 360. this reſembles the former in many circumſtances, but differs from it chiefly in this, that, in the room of a ſimple Screw, MORAND has ſubſtituted a compound Screw, that takes place ſooner; this he makes always of Steel, and it acts more in one Turn, than the other can in two or three. This you may ſee more largely deſcribed, if you conſult the Author himſelf; but GARENGEOT makes ſome exceptions to this Inſtrument, and prefers PETIT's.

Another.

XIV. Some years ſince, when I attended the Army, I was called to an Officer of Rank, who was dangerouſly wounded: I ſaw there a kind of *Tournequet* made of Iron, and very heavy, that much reſembled MORAND's, but differed from it in ſome things, I do not know by whoſe direction; but as I have never ſeen it deſcribed before, I have given you a Plate of it, *See Plate* V. *Fig.* 7. A is the

the lower Part pierced all round the Edges with ſeveral *Foramina*, by which means it will admit of a Bolſter or Cuſhion to be ſewed to it; B is an Iron Barrel, to receive the Screw; C is the upper Part; D is another Barrel fixed upon that, for the Reception alſo of the Screw; EE are the Extremities of the upper Plate, one of which is ſupplied with ſmall Hooks, the other with large Hooks, and with an Opening alſo to paſs the Roller through, and faſten it, almoſt in the manner we have deſcribed it in ours of *Fig.* 2. and 5. F is a kind of Ring, ſurrounding the Screw, above the upper Plate; G is a ſquare Body made like a female Screw, for the Reception of the ſmall Screw H, and the great Screw IK, which would otherwiſe fall down, but by this means are eaſily kept up in the Box D; L is an Iron Cylinder, which is firmly fixed in the lower Plate, but is looſe in the upper; this keeps the two Plates in the ſame Situation with each other, and at the ſame time admits the upper Plate to ſlide up and down freely, as Occaſion ſhall require.

An Amendment of my own.

XV. I endeavoured to improve this Inſtrument, and ordered one to be made of Braſs after the manner deſcribed at *Plate* VI. *Fig.* 1. In this the upper Plate is much ſhorter than the lower, the Belt is fixed at one End, and after it has been brought round the Limb, is faſtened to the other End by ſmall Hooks; the Belt paſſes through the lower Plate at both Ends, by Holes made for that Purpoſe; the Inſtrument is by this Contrivance always kept even, and does not change its Poſture upon the Action of the Screw. The Reader may chuſe which of theſe Inſtruments he thinks fitteſt for his Purpoſe, they will all anſwer the Intention they were made for; one does it ſooner, the other takes a little more Time: But this Proverb will always have its Force, *Sat citò, ſi ſat bene.* How the *Tournequet* is to be applied in Amputations of the larger Limbs, we ſhall ſhew in the proper Place.

What is to be done by internal Aſtringents.

XVI. Before we take Leave of this Article, it may be proper to inform you, that in Wounds of the large Arteries, *the internal Uſe of aſtringent Medicines will be of no Service*; beſides, they frequently occaſion Pain, Inflammation, Fever, and other Diſorders, by making Obſtructions in the Lacteals, Meſenteric Glands, and other Veſſels; therefore it is beſt to lay them entirely aſide.

II. *Of Pain in Wounds.*

Of Pain in Wounds.

XVII. *Pain* may be reckoned amongſt the moſt grievous Symptoms that uſually attend Wounds; for great Watchfulneſs, Weakneſs, Convulſions, Inflammations, Gangrene, and even Death itſelf, ariſe frequently from this Cauſe. The *Cauſes* of Pain are many: 1. Sometimes an extraneous Body is left in the Wound, which occaſions great Irritations, eſpecially in nervous Parts of the Body. 2. Corroſive Medicines, which are ſometimes applied to ſtop the Hæmorrhage. 3. Or a large Obſtruction of the Blood may happen near the Wound, and bring on Tumor and Inflammation; this frequently happens in Plethoric Habits of Body, or in Gun-ſhot Wounds, becauſe in theſe Wounds there is uſually but a ſmall Diſcharge of Blood. 4. Laſtly, Wounds, or Tenſion of Tendons, may well be reckoned amongſt the principal Cauſes of Pain.

Of Remedies for Pain.

XVIII. It will be well worth our While to conſult the Cauſe of Pain, that we may remedy it with the greater Eaſe; for all Pain will not admit of the ſame Remedy. Therefore, 1. *If any extraneous Body is left in the Wound*, the firſt Intention is to remove it, in the manner we taught at *N.* 31, 32, 33. 2. *If the*

Pain ariſes from the Application of any corroſive or aſtringent Medicine, it muſt be removed, or at leaſt moderated; which may be done *cum Decoctis ex Malva, Althæa, Floribus Chamomill. Sambuc. Melilot. Verbaſc. Sem. Lin. Papav. &c.* The Wound ſhould be cleaned with a Sponge expreſſed from Decoctions of this kind, till nothing corroſive remains in it, and till the Pain is removed: Cataplaſms may be applied warm to the Wound, made of the foregoing Herbs. There are other Medicines alſo, which Phyſicians preſcribe to be given internally, to aſſwage Pain. 3. *When the Pain ariſes from the Violence of the Inflammation*, which is frequently the Caſe, it will be proper to bleed as largely as the Strength of the Patient will allow; but if you cannot draw a ſufficient Quantity, you muſt ſcarify the Part as near the Wound as is convenient, eſpecially in Gunſhot Wounds. By this Method the ſtagnating Blood it ſet at Liberty, and the Inflammation and Pain are inſtantly relieved. In the mean time, you may foment the Wound *cum Oxycrato vel Spiritu Vini Camphorati*; or, which is much better, *cum Aqua Calcis Vivæ modicâ Portione Spiritûs Vini Camphorati commiſt.* Emollient Cataplaſms, and ſuch Applications as we ſhall more largely treat of when we come to ſpeak expreſsly of Inflammations, take place here. Abſorbents ſhould be taken inwardly, ſuch as *Lapis Cancrorum, Conchæ præparatæ, Antimonium Diaphoreticum*, mixed with a moderate Proportion of *Nitre*; all Things ſhould be forbid that encreaſe the Circulation. Laſtly, 4. *Where the Pain ariſes from an Injury of the Tendon or Nerve*, the Cure is very difficult; for this Caſe is always attended with violent Inflammations and Convulſions; to prevent ill Conſequences that may happen in Wounds of this kind, it will be proper to dreſs with *Balſam. Peruv. Balſam. Copaib. Ol. Terebinth. vel cum miſtura ex Ol. Terebinth. & Aq. Regin. Hungar. confect.* Theſe Medicines ſhould be moderately warmed before they are applied to the Wound, laying a Cataplaſm over the Dreſſings, compoſed *ex Herb. Scord. Abſinth. Abrotoni, Flor. Sambuc. Chamomill. &c. Vin. q. s. decoctis.* Internal Medicine alſo ſhould not be neglected in this Caſe. If the Pain is not leſſened by theſe Remedies, there is great reaſon to deſpair, unleſs the wounded Part of the Nerve be inſtantly divided; for although this Method deprives all the Part of the Limb that lies below the Diviſion of the Nerve of Senſe and Motion, yet in ſuch a deſperate Caſe it is better to loſe the Uſe of a Limb than Life itſelf.

III. *Of Spaſms and Convulſions.*

Convulſions, from whence.

XIX. Spaſms and Convulſions are brought on many ways; for they not only ariſe from all the Cauſes that occaſion Pain, but frequently from too great Loſs of Blood. This appears from the many Examples of Perſons that have died by the Violence of the Hæmorrhage. All theſe before they expire fall into ſtrong Convulſions and Diſtenſions of the Nerves.

How Convulſions are to be cured.

XX. In order to remedy theſe Diſorders, it is neceſſary firſt to diſcover their Cauſe. Whenever Convulſions are occaſioned by extraneous Bodies, by corroſive Medicines, or by wounded Nerves, the ſame Methods are to be followed, which we adviſed for the Relief of Pain from the ſame Cauſes at *N.* 18. If they are occaſioned *by Inflammation or Fulneſs of Blood*, Blood-letting will generally bring Relief, eſpecially if we uſe at the ſame time the emollient Remedies adviſed at *N.* 18. If they are occaſioned *by Loſs of Blood*, Blood-letting is to be avoided, notwithſtanding ſome amongſt the *French* adviſe it in convulſive Diſorders ariſing from

from what Cauſe ſoever. *See* GARENGEOT, *in his Chirurgie, Chap.* 2. In this Caſe it will be better, by the Methods before adviſed, to ſtop the Blood, and to give the Patient warm Broth, warm Milk, and Draughts of warm Ale thickened with Yolks of Eggs, and ſweetened with Sugar; by this Method the Veſſels are filled again by degrees, and, the Cauſe ceaſing, the Convulſions go off. In the mean time ſtrengthening Medicines ſhould by no means be neglected, particularly [a] Wine, Emulſions, and ſtrengthening Drinks.

IV. *Of the Symptomatical Fever.*

XXI. If the Patient has a quick Pulſe, and an increaſed Heat, we ſay he has a *Fever*. This Symptom is of very dangerous Conſequence, and will quickly prove mortal, if not timely relieved by the Aſſiſtance of the Phyſician. Symptomatic Fever, what.

XXII. In order to cure Fevers of this ſort, the Phyſician ſhould forbid the Uſe of every Thing, both in Medicine and Diet, that may encreaſe the Heat, and order ſmall Liquors to be drank plentifully, ſuch as Barley-water, thin Gruels, Ptiſans, *&c.* Cooling Powders mixed with Nitre ſhould be preſcribed, the Bowels ſhould be kept open with Clyſters, if they do not anſwer naturally. Where the Patient has loſt but a ſmall Quantity of Blood, and is of a Plethoric Habit, it will be right to open a Vein. A very thin Diet is to be adviſed, and in ſmall Quantities at a time. Fleſh, and all ſolid Diet and Spices ſhould be abſolutely forbid. Cure of the Symptomatic Fever.

CHAP. III.

Of Gun-ſhot WOUNDS.

I. GUN-SHOT Wounds are attended with much worſe Conſequences than Wounds that are made by ſharp Inſtruments; for the Parts are more ſhattered and torn, eſpecially when the Shot fall upon the Joints, Bones, or any conſiderable Part. Gun-ſhot Wounds

II. Wounds of this kind have an Eſchar formed upon them, and therefore are attended with little or no Hæmorrhage at firſt, unleſs ſome conſiderable Veſſels are wounded; but as ſoon as the Eſchar falls off, the Hæmorrhage is ſometimes ſo violent as to endanger the Life of the Patient, unleſs a Surgeon is at hand; for the five or ſix firſt Days there is little or no Diſcharge of Matter, therefore it is not to be admired at, if Gun-ſhot Wounds exceed all others in Violence of Symptoms, ſuch as Inflammation, Pain, Gangrene, *&c.* diſcharge ſmall Quantities of Blood and Matter.

III. The Eſchar which is formed upon theſe Wounds is not occaſioned, as the Ancients imagined, ſo much by the Heat of the Bullets, as by the Rapidity with which they deſtroy the Parts; and the Violence of the Symptoms is owing chiefly to this manner of wounding. Formerly they were of Opinion that there was ſomething poiſonous in Wounds of this Sort; but in this alſo they were miſtaken, for nothing poiſonous enters the Compoſition either of the Powder or Ball.

IV. Gun-ſhot Wounds are ſome deeper than others; in ſome the Muſcular Parts alone are wounded, in others the Veſſels, Bones, or Viſcera. Sometimes How many Differences.

[a] See CELSUS, B. V. Ch. 26. N. 25.

the Ball paſſes clear through, ſometimes it remains fixed in the Wound, and frequently carries Part of the Cloaths or Wadding with it; from the Difference of theſe Circumſtances different Symptoms ariſe.

What happens in Wounds of the Cranium.

V. *Gun-ſhot Wounds in the Cranium* are attended with great Danger; for even thoſe that appear to be very ſlight externally, frequently bring on terrible Symptoms by the Concuſſion of the internal Parts which they occaſion. Inſomuch that it is very ſurprizing to ſee how ſmall an external Wound upon this Part will bring on Death, unleſs prevented by the Trepan.

In Wounds of the Viſcera or Joints.

VI. Internal Wounds of this Sort are extremely dangerous; but if no large Veſſel is wounded, they are frequently cured. When they are inflicted upon the Joints or Bones, they are attended with very bad Symptoms; for it is next to impoſſible in this Caſe to eſcape Inflammation, Gangrene, Caries, and dangerous Fiſtulæ, which either require Amputation of the Limb, or leave the Parts without Senſe or Motion.

Extraneous Bodies are to be removed.

VII. If any Part of the Cloaths, Wadding, or other extraneous Body is forced into the Wound, it muſt be removed before you can attempt to heal. The ſame Caution alſo is to be obſerved with regard to Splinters of Bones.

Cure.

VIII. In treating theſe Wounds, theſe Rules muſt be obſerved: To extract all foreign Bodies, to ſtop the Hæmorrhage, to promote Suppuration, to encourage new Fleſh, to make an even Cicatrix.

Extraction of foreign Bodies.

IX. The Extraction of foreign Bodies ſhould be performed, if poſſible, with the Hand; or, if that cannot be done, with the Forceps or a Hook, *See Plate* III. *Fig.* 3, 4, 5, 6, 7, 8. They are eaſieſt removed at firſt; for, after ſome Delay, the Tumor and Inflammation of the Parts render it difficult and painful: Beſides, Bullets will by degrees work themſelves deeper, and be buried under the Muſcles; which will occaſion Fiſtulæ, Rigidity of the Limb, and other Inconveniences. In extracting Balls that lie deep, you muſt take great Care not to lay hold of Blood-Veſſels or Nerves; which Accident will be beſt avoided by introducing the Forceps ſhut, and not opening them till you feel the Ball.

How to enlarge the Wound.

X. Sometimes the Orifice of the Wound is ſo narrow, that it will be impoſſible to come at the Body you have a Deſire to extract, without making a larger Opening; which ſhould be done on the moſt convenient Side, always obſerving that no Nerve, Blood-Veſſel, Tendon or Ligament lies in your Way. When the Parts are very much ſwelled or inflamed, an Opening of this kind is frequently of Service; for, by this means, the obſtructed Blood is diſcharged, and the bad Conſequences of the Inflammation are prevented. But as two Balls are frequently concealed in the ſame Wound, after the Removal of one, the Surgeon ſhould diligently ſearch for another, or for any other extraneous Body that may be forced in with it, which may protract the Cure of the Wound.

Where Balls are to be extracted, and when.

XI. When you attempt the Extraction of a Ball, or other extraneous Body, you ſhould endeavour to place your Patient in the ſame Situation that he was in at the Time of receiving the Wound; for, by frequent Changes of Situation, the Ball will eaſily bury itſelf, and get out of your Reach. Whenever the Ball has penetrated ſo deep, that you can eaſily feel it with your Finger on the Side oppoſite to the Wound, the Surgeon ſhould examine nicely whether it is ſafeſt to bring it back by the way it came in, or to make an Opening upon it, and draw it out at the oppoſite Side. If the Wound cannot ſafely be enlarged, nor the Balls extracted without great Pain and Danger, they muſt be left in the Wound, either

either till the Pain is abated, or the Paſſage rendered ſo eaſy by Suppuration, that they work themſelves out. On the other hand, extraneous Bodies are inſtantly to be removed, where there is Danger of their bringing on Convulſion, Pain and Inflammation by being left behind. If a Ball has paſſed into any of the Cavities of the Body, where the Extraction of it cannot be attempted with Safety, it is beſt to leave it where it has lodged, and heal the Wound: For there have been variety of Inſtances, where Perſons have carried Balls within them for many Years, nay for the beſt Part of their Lives, without ſuffering any Inconvenience; and it ſometimes happens, that they will work themſelves into ſome other Part of the Body, from whence they may be extracted with Safety.

Of Balls in the Joints or Bones.

XII. Balls lodged in the Bones, are to be extracted with the roſtrated Forceps, obſerving the ſame Rules and Directions we have already laid down. When this cannot be done, another Method is to be attempted; to wit, they may be laid hold on with a Sort of Trepan, which I have deſcribed at *Plate* III. *Fig.* 7. This is neceſſary to extract Balls that are lodged in Bones, which are covered with a large Quantity of Fleſh, as in the Thigh-Bone; but if the Ball is ſo ſtrongly fixed in the Bone, as to reſiſt all theſe Methods, it muſt be left there till the Parts ſuppurate, and ſet it at Liberty. Balls that are thrown into the Joints are to be removed with all Expedition, for Delays in this kind are extremely dangerous; but it is ſcarce poſſible here to eſcape violent Pains, Inflammations, and Caries of the Bones, which generally require Amputation of the Limb.

Where Bones or Joints are ſhattered.

XIII. In Wounds from large Guns, the Joint or Bone are frequently grievouſly ſhattered, or caried off; in this Caſe it is far better to take off the Limb at once, than to ſpend a great deal of Time in fruitleſs Attempts to cure. The natural Figure of the ſhattered Joint can never be reſtored, and the Branches of Nerves that were ſent to the Bone, the Inſertion of the Tendons and Ligaments being torn from it in many Places, cannot but bring on violent Inflammations, and Gangrene; but where the Bones are not violently ſhattered and broken, the Surgeon ſhould be careful in time to remove the Splinters, and all extraneous Bodies, and to treat the Wound according to the Rules preſcribed above.

Where the Crural or Brachial Arteries are wounded.

XIV. Laſtly, if any large Artery is wounded, either in the Arms or Legs, which will appear by the Loſs of Blood, the *Tournequet* ſhould be applied; *See above, Chap.* II. §. 9, 10. The Blood being ſtopped, you muſt endeavour to take up the Veſſel, by the Aſſiſtance of the crooked Needle, (*Chap.* II. §. 7.) which Practice has ſucceeded with me frequently; but if this cannot be done, or if from the Condition of the Wound you ſhall entertain no Hopes of Succeſs from future Dreſſings, it will be proper to take off the Limb a little above the Wound.

Cure of the Wound.

XV. The Wound being cleaned, and the Blood ſtopped, the firſt Intention is to uſe our utmoſt Endeavours to prevent or aſſwage the Tumor and Inflammation. *The Wound ſhould be dreſſed up with Lint dipped in Spirits of Wine warmed,* covering it up with Compreſſes wet with the ſame Liquor, or with camphorated Spirit of Wine, either alone or diluted with *Aqua Calcis.*

Suppuration of the wounded Parts.

XVI. Having done this, the next Intention is, *to forward the Suppuration of the bruiſed and torn Parts*; to this End, ſome uſe the common Digeſtive made *ex Terebinthin. Venet. & Vitello Ovi*; or the following ℞, *Unguent. Baſilic. Balſam. Arcæi ana* ℥i. *Spirit. Vini, Ol. Ovor. ad* ℥i. *m. f. Unguentum.* Where there is a very great Corruption of the Parts, you may add to theſe *Pauxillum Myrrh. atque Aloës,*

Aloës, Theriacæ, Unguenti Fuſci, or in Places where the Nerves do not lie bare, *Præcipitat. rub.*

Pervious Wounds how to be treated.

XVII. *In deep Wounds, where the Ball has gone quite through*, a particular Method is neceſſary to be uſed; a Skein of Thread being drawn through the Eye of a long blunt Needle, (*Plate* V. *Fig.* 1.) and well ſaturated with the Ointment which we have preſcribed, ſhould be paſſed through the Wound after the manner of a *Seton*, and kept there till you ſhall diſcover by the Redneſs of the Wound, that the corrupted Parts are caſt off, and the whole is in a Readineſs to heal; then the Thread may properly be drawn out.

What is next to be done.

XVIII. We are now to explain, *how the Wound is to be filled up with new Fleſh, and neatly cicatrized*; but nothing new can well be ſaid upon that Head, ſince the ſame balſamic Medicines, and other Methods, which we taught above at *Chap.* I. §. 35. and the following, will take Place here; though ſome in the room of this Method uſe a Water in great requeſt amongſt the *French*, and called by them *l'Eau d'Arquebuſade.*

Of bad Symptoms attending theſe Wounds.

XIX. The bad Symptons which uſually attend theſe Wounds, to wit, Hæmorrhage, Fever, Tumor, Inflammation, Convulſion, are to be treated in the manner we propoſed above at *Chap.* II. When you perceive the Lips of the Wound (as they almoſt always are) to be black, livid, flaccid, ſtinking, the Parts thus vitiated ſhould be inſtantly ſeparated from the ſound Parts: The moſt proper Application here is *Unguentum Ægyptiacum Spiritu Vini dilutum, vel et æquali Unguenti digeſtivi Portione permixtum*; or you may apply Dreſſings of red *Præcipitate* mixed with the digeſtive Ointment; over theſe lay Compreſſes dipped *in Spiritu Vini Camphorato calido, Theriacâ mixto, vel Aquâ Calcis Spiritu Vini Camphorato roboratâ.* But if this Tendency to a Mortification goes deep, it will be proper to ſcarify to the quick; and if the Medicines before-mentioned have had but little Effect, you muſt apply ſtronger and more ſtimulating Remedies. I have ſeen very good Effects in this Caſe from the *Aqua Phagædenica*, which we make *ex Aqua Calcaria & Mercurio Sublimato.* Of the ſame Virtue is that Water which we prepare *ex Aq. Calcar.* ℔i. *admixtâ Mercurii vivi* ℥i. *per Aquæ Fortis* ℥ii. *ſolutâ.* Theſe Medicines are ſerviceable even in Caries of the Bones: But in Wounds of the Ligaments or Joints we muſt not attempt to uſe any ſharp Applications, ſuch as the *Unguentum Ægyptiacum*, or *Aqua Phagædenica*; but muſt be rather ſatisfied with Balſamics, ſuch as the *French Water l'Eau d'Arquebuſade, Balſamus Peruvianus, Tinctura Myrrhæ aut Aloës, Sale Ammoniaco, & Spiritu Vini parata, Eſſentia Succini, Spiritus Maſtichis, Aqua Reginæ Hungariæ, Oleum Terebinthinæ Aquâ hac dilutum, &c.* Theſe Remedies are to be applied to the Wound moderately warm.

What Internals are proper.

XX. Balſamic Medicines likewiſe ſhould be adminiſtred internally, and ſuch as reſiſt Corruption; of this kind are *Elixir Proprietatis, Eſſentia Myrrhæ & Aloës, Eſſentia Succini, Balſamus Peruvianus, &c.* either of theſe given from thirty to forty Drops, will be very ſerviceable to the Patient. Where he is very weak, it will be proper to raiſe him with Cordials, ſuch as the *Confectio Raleighan. &c.* the remaining Part of the Cure may be performed according to the Rules laid down at *Chap.* I. *Sect.* 35. and the following.

How Gunpowder is to be taken out of the Face.

XXI. In Gun-ſhot Wounds, ſeveral Grains of Powder frequently penetrate the Skin of the Face, and occaſion a Deformity, if they are not taken out; which may be done with a Pen, or an Inſtrument like an Ear-picker; *See Plate* V. *Fig.* 14.

but

but if they are got in too deep to be picked out in this manner, the Skin muſt be laid open with a fine ſmall Lancet, that you may get at them with the Inſtruments we have deſcribed. Great Care ſhould be taken not to break the Grains in taking them out, for that will occaſion very foul Spots.

CHAP. IV.

Of WOUNDS *of the Abdomen.*

The Intent of this Chapter.

WE have hitherto taught what was in general to be attended to with regard to any Sort of Wound, whether made by Cutting, Stabbing, or by the Exploſion of a Gun. We come in the next Place to explain fully the Nature of each particular Wound, and ſhall ſpeak diſtinctly of Wounds: 1. Of the *Abdomen*. 2. Of the *Thorax*. 3. Of the *Neck*. 4. Of the *Head*.

Differences of Wounds in the Abdomen.

II. *Wounds of the Abdomen* only affect the common Integuments and Muſcles, or penetrate into the Cavity of the Abdomen: Thoſe that penetrate into the Cavity of the Abdomen, are inflicted lengthways, obliquely or tranſverſely; and in theſe the Bowels either burſt out through the Wound, or preſerve their natural Situation. Theſe Differences of Wounds in the Abdomen ought to be diligently attended to by the Surgeon, ſince they require a different kind of Treatment.

How thoſe Wounds are to be diſcovered.

III. Theſe Wounds may be conveniently enough examined; 1. by the Eye; 2. by paſſing the Finger or the Probe; or laſtly, 3. by injecting warm Water into the Wound. If the Water meets with no Obſtruction, you are ſure that the Wound penetrates; but if it returns back upon you, and the Probe meets with Reſiſtance, the Abdomen is not entirely opened.

Wounds that do not penetrate.

IV. Wounds of the Abdomen which do not penetrate the Abdomen, are attended with much the leaſt degree of Danger. They are generally divided into two Sorts: 1. Either the Wound is only upon the common Integuments; or, 2. the Muſcles alſo of the Abdomen are divided, as far as the *Peritoneum*. The firſt of theſe is too ſlight to require a diſtinct Method of Cure from other Wounds; but Wounds of the laſt Claſs are extremely dangerous, becauſe the Inteſtines, in this Caſe, eaſily fall through the Wound. If the Wound is large, great Skill is required in the Surgeon, eſpecially if it is made in a tranſverſe or oblique Direction; for in this Caſe the Suture is neceſſary to keep the gaping Lips of the Wound together, as we ſhewed partly above at *Chap.* I. *N.* 44. The Manner of performing this we ſhall deſcribe below in a Chapter upon *Gaſtroraphy*. Having taken theſe Precautions for preſerving the *Peritoneum* and Inteſtines in their natural Situation, the Surgeon ought to dreſs up the Wound with vulnerary Balſams, and an adhæſive Plaſter; to give the Patient Reſt, to order him a ſoft Clyſter if his Bowels are not naturally open, and to enjoin Abſtinence.

How Wounds are to be ſearched when they penetrate.

V. When the Surgeon diſcovers that the Wound penetrates into the Abdomen, he ought, before all Things, to examine well whether any of the Contents of the Abdomen partake of the Injury. He will eaſily determine in the Negative, if it ſhall appear; 1. That there is no great degree of Weakneſs, Hæmorrhage, Pain, Fever, *&c.* 2. If upon laying the Patient upon the wounded Side, there is no Diſcharge of Chyle, Gall, Excrement or Urine; 3. If Milk, being injected warm, returns without any Alteration of its Colour; 4. If the inflicting Inſtrument

ment is not very ſharp; and laſtly, 5. If there is no Vomiting nor Diſcharge of Blood by the Mouth, Stool, or Urine, nor Swelling and Hardneſs of the Belly. But as the Operation of *Gaſtroraphy* is ſometimes extremely neceſſary, and always attended with Danger, if it is not performed with the greateſt Accuracy, I have thought it my Duty to deſcribe it carefully in the following Chapter.

CHAP. V.

Of GASTRORAPHY.

When *Gaſtroraphy* is unneceſſary.

I. GASTRORAPHY is the Suture of Wounds of the Abdomen. This Operation is unneceſſary, 1. when the Wound is only in the Muſcular Part; or, 2. is not very large, eſpecially if it is made lengthways: For if the Wound ſhould penetrate into the Cavity of the Abdomen, and even let out Part of the *Omentum* or *Inteſtines*, yet where it is very ſmall, as Wounds generally are which are made by Puncture, or happen lengthways, upon returning the Parts which are puſhed out, ſtopping the Wound up with a ſoft Tent, and ſecuring all with a proper Bandage, it may be healed without the Help of the Needle. Beſides, in fat Perſons, this Operation is very difficult; and it would be an Act of great Cruelty in a Surgeon to perform the Operation upon a Man, when he might be cured after an eaſier Method.

When it is neceſſary.

II. But there are two Caſes where *Gaſtroraphy* is abſolutely neceſſary; the firſt is, where the Wound is ſo large that there is no poſſibility of retaining the Inteſtines by any other Method: For as the Inteſtines are continually puſhed forwards in the Act of Inſpiration, by the Action of the *Diaphragm* and the Abdomen, the falling down of the Inteſtines in this Caſe is unavoidable, and therefore the Operation neceſſary. But there is another Caſe alſo, where this Operation is required; to wit, in large tranſverſe Wounds of the Abdomen where the Muſcles are divided, but the *Peritoneum* is not concerned. *See above Chap.* IV. *N.* 4.

Of the falling down of the Inteſtines.

III. In Wounds of the Abdomen the chief Enquiry is, *Whether the Omentum or Inteſtines are let out?* If none of theſe have burſt thorough the Wound, the Lips of the Wound ſhould be kept as cloſe together as poſſible with the Hands, and the Patient kept with his Head lying downwards till the Wound is ſufficiently ſecured from letting out the Contents of the Abdomen. But when the Inteſtines are already fallen out, they muſt be returned with the greateſt Expedition, leſt they ſhould receive any Injuries from the external Air; but we ſhould firſt examine whether they have received any Wound or not, and whether they preſerve their natural Warmth and Colour. For where they are cold, livid and dry, or wounded, they are not to be returned ſuddenly, but treated in the manner we ſhall deſcribe below.

How to diſcover a Wound in the Inteſtines.

IV. You will eaſily perceive that there is ſome Hurt in the Inteſtines, though the Wound does not immediately appear, if there is a more than ordinary Flaccidity in them; when this Symptom appears, it will be proper to pull the reſt of the Inteſtines gently forward, till you come at the Injury, and when you have found it, you may treat it as we ſhall ſhew you in *Chap.* VI.

How to return the Inteſtines.

V. When you find the Inteſtines uninjured, they muſt be inſtantly returned, to prevent them from receiving any Injuries from the external Air; in order to do

do this with the greater eaſe, put the Patient in the ſupine Poſture which we deſcribed at *N.* 3. only placing him upon the ſide oppoſite to the Wound: The Patient being thus ſituated, an Aſſiſtant ſhould endeavour to return the Inteſtine with his two fore Fingers, taking care not to take off one Finger till the other is upon the Gut. The Patient ſhould be encouraged all the while to hold his Breath, and the Aſſiſtant ſhould bring the Wound together with his Fingers, or with Hooks. *Plate* VIII. *Fig.* 2, 3.

How the Inteſtines are to be treated when they are dry and cold.

VI. Hitherto we have deſcribed the method of returning the Inteſtine whilſt it was warm and unwounded; it remains that we teach the method of treating the Inteſtines when they are cold and dry: In this caſe it is beſt to foment them with warm Water or Milk before you return them, or, where you can have that Opportunity, get the Cawl of a Calf, a Lamb, a Hog, or of any other Animal juſt killed, wrap this round the Inteſtines whilſt it is reeking, and keep them in it till they recover their natural Heat and Colour. If this dryneſs or coldneſs of the Parts is very ſmall, and the Inteſtines are not at all corrupted, it is beſt to return them inſtantly into the Body, where the Heat and Moiſture of the neighbouring Parts being natural to them, will give them a more ſpeedy and natural Refreſhment, than can be reconciled to them by any artificial means.

How the Inteſtines are to be returned through a ſmall Orifice.

VII. When the Inteſtines are forced through a ſmall Wound, and are afterwards ſo diſtended with *Flatus*, that they cannot conveniently be returned, it will be proper to pull the Inteſtine gently forward, that more of it may come out, that ſo the *Flatus* being divided may take up leſs room in any one Part. An Aſſiſtant ſhould now gently dilate the Wound with his Hands, or two Hooks, *Plate* VIII. *Fig.* 2, *or* 3. fixed in the internal Membrane, that the Surgeon may return the Inteſtines; which when he has done, in ſuch a manner that each Part may recover its natural Situation, (*See N.* 5.) the Wound ſhould be ſecured firſt with his Hand, that the Bowels may not burſt out again; then it ſhould be filled up with ſome Doſſils; or, where there is a conſiderable quantity of Blood ſpilt in the Abdomen, with a ſoft [a] Tent, *Plate* II. *Lett.* L, M, N, O. dreſſing up with the proper Plaſters, Compreſſes and Bandage. The Patient is to be kept as ſtill as poſſible, lying as much as he can upon the Wound: After this the Wound is to be dreſſed daily, or where there is a large diſcharge of Matter twice every day, with ſome vulnerary Balſam; and if we proceed in this manner, where the Wound is not very large, the Patient may be excuſed from the Pain, and the Surgeon from the Trouble of making the Suture.

How ſmall Wounds are to be enlarged.

VIII. But if the Wound is ſo narrow, that we can neither bring the Gut forward nor reduce it, it muſt be enlarged with the Knife, beginning the diviſion at that end of the Wound which is moſt convenient, taking great care not to wound the *Linea alba*, the Veſſels which lie under the *Recti Muſcles*, or laſtly the Inteſtines themſelves. Some Surgeons, in the room of the Inciſion Knife and Conductor, uſe in this place the *Syringotomus*, whoſe Point is guarded with a

[a] Some of the modern Writers in Surgery, particularly GARENGEOT, forbid the uſe of Tents in all *Wounds of the Abdomen. In the Year* 1734, a young Surgeon in my neighbourhood obſerved this rule, when he was called to a man that had received a Wound between the Navel and the Penis, the Wound penetrated the Abdomen; for the firſt two Days the Symptoms were favourable, but upon the fourth day he died; upon opening his body we found a large colleſtion of Matter in the Abdomen, with the Omentum putrified. If a Tent had been uſed, the Matter would have been diſcharged, and the Patient's Life ſaved.

Button; ſome are fond of other Inſtruments, but I think the beſt Inſtrument by far in this caſe, is the Knife which I invented for this purpoſe, and have given you a deſcription of at *Plate* V. *Fig.* 3. or one of thoſe at 4 *and* 5. the Knife is never to be uſed till the Aſſiſtant has applied a warm Omentum to the Inteſtines that are already extra-abdominal, to prevent them from Injuries; but where the Inteſtines are ſo inflated, that it is impoſſible to get the probe end of the Knife, or a Conductor into the Abdomen, then hold back the Inteſtines with the left hand, and with the right make an Inciſion through the common Integuments and Muſcles, as far as the *Peritoneum*, ſponging up the Blood as you go on: The Wound will moſt likely be ſufficiently relaxed by this to make way for the re-admiſſion of the Inteſtines, at leaſt it will admit the end of the Knife to divide the *Peritoneum*, ſo that you may enlarge your Wound at pleaſure, and return the Gut as directed at *N.* 5.

How to return them without enlarging the Wound.

IX. If any hardened Excrement lies in the Inteſtine, and impedes its reduction, emollient Fomentations and Cataplaſms ſhould be applied, and more of the Inteſtine ſhould be pulled out: For by this means the Fæces may be divided by the Hands, and the Inteſtine returned conveniently. PARÆUS, and other Surgeons have recommended a particular method of returning the inflated Inteſtine without enlarging the Wound, by making ſmall Punctures in the Inteſtine with a Needle, through which Punctures the Wind will certainly eſcape, and the ſides of the Gut ſubſide; and this they affirm is attended with no danger. Nevertheleſs, for my own part, I prefer the Enlargement of the Wound to making theſe Punctures, and to the pulling out of a greater ſhare of the Inteſtine to divide the Contents, eſpecially ſince many Surgeons affirm that theſe Punctures are neither ſafe, nor uſeful for the end to which they are directed. BLANCARD has given us an inſtance where they failed, in his *Collect. Medico-Phyſic. Part. ult. Obſ.* I.

When and how to heal the Wound without the Operation.

X. When the Inteſtines are returned, if the Wound is not large, and is made lengthways, there will be no occaſion to perform the Operation, which is always of dangerous conſequence, and therefore ſhould never be attempted but in caſes of the greateſt Emergency. If the Suture is not abſolutely neceſſary, paſs a ſoft Tent into the lower part of the Wound, and apply ſticking Plaſters to the ſides of it, covering them with long thick Bolſters, ſecuring theſe dreſſings with a uniting Bandage, ſuch a one as you will find deſcribed in *Plate* V. *at Fig.* 8. When the Patient is thus dreſſed, draw ſome Blood from the Arm, to prevent an increaſe of the Inflammation; adviſe him to keep very ſtill, and obſerve a ſtrict Regimen with regard to his Diet. The dreſſings are not to be removed, unleſs ſome violent Symptom requires it, before the third day; and afterwards only once a day, or rather every other day, leſt the union of the Wound ſhould be retarded by frequent handling. On the other hand, if the Wound is large, and made in an oblique or tranſverſe manner, ſo that the Inteſtines cannot be kept within the Abdomen by this method, the Operation muſt be performed without delay.

How to perform the Operation with two Needles.

XI. The Operation may be performed in the following manner: Paſs a ſtrong double or quadruple Thread, well waxed, through two crooked Needles, (*See Plate* VI. *Fig.* 5 *and* 6. or another, which was communicated to me by a Friend, at *Fig.* 7.) with theſe ſtitch up both ends of the Wound, beginning at one end with the upper Lip of the Wound, paſſing the Needle through the *Peritoneum*,

ritoneum, Muſcles of the Abdomen, and the common Integuments, from within outwards, leaving about a Thumb's breadth between the ſtitches and the mouth of the Wound, that they may take the ſtronger hold, obſerving the ſame method in paſſing the other Needle through the lower Lip: Whilſt you are paſſing the Needle with one hand, it will be proper to ſupport the Lips of the Wound with the other, to prevent the Inteſtines from being wounded. It will frequently be very difficult to hold the Needle ſteady with the naked hand; to remedy this inconvenience, the modern Surgeons have invented an Inſtrument to receive the Needle, and form a handle for it, which the *French* call *Portaiguille*. *See Plate* VI. *Fig.* 2, 3 *and* 4.

With a ſingle Needle.

XII. If you are not provided with two Needles, the Operation may be performed with one: For after you have ſtitched up one end of the Wound in the manner we have deſcribed, you may take off the Needle, and perform the ſame Operation on the other end, and proceed afterwards as uſual.

Large Wounds require many Stitches.

XIII. In a Wound of a middling ſize, that is to ſay, of about two Fingers breadth, one Stitch in the middle will be ſufficient; but in larger Wounds, the Stitches muſt be repeated in proportion to their ſize, leaving a Thumb's breadth between each of the Sutures, the extremities of the Thread hanging down on each ſide, as we have ſhewn you in *Plate* III. *Fig.* 17. and in *Plate* IV. *Fig.* 15. Having made the proper number of Sutures, an Aſſiſtant ſhould keep the Lips of the Wound together, whilſt the Surgeon faſtens the ends of the Threads in Knots.

How the Knots are to be made.

XIV. Both ends of the Thread are to be taken up, and to be tied in a double Knot, as we taught above in *Chap.* I. *N.* 44 *and* 45. paſſing a ſmall Bolſter between the two Knots, (*Plate* II. *Fig.* 22.) to prevent the Skin from being hurt. Where there are more Sutures than one, you muſt begin at the upper Part of the Wound, tying them down in order, that before the laſt is tied, a ſoft Tent, of the ſize of a Finger, with a Thread faſtened to the end of it, may be introduced into the lower part of the Wound: This Tent will keep a Paſſage open for the evacuation of grumous Blood or Matter, which may be collected in the cavity of the Abdomen. Some of the modern Surgeons, particularly GARENGEOT, forbid the uſe of Tents in theſe Wounds, and aſſert that the Spaces left between the Sutures will afford a ſufficient Paſſage for the diſcharge of Matter from the Abdomen; but I believe this frequently proves to be very falſe. See the Obſervation which we have added by way of Note to *N.* VII. *of this Chapter*. This one fact has more weight with me than all the ingenious Reaſons that can be brought to ſupport the contrary opinion.

How the Wound is to be dreſſed after being ſtitched.

XV. The Stitches being all tied, and the Tent paſſed into the lower part of the Wound, the Wound ſhould be well anointed with ſome vulnerary Balſam, and covered with pledgits of Lint, a ſticking Plaſter, and Bolſters, ſecuring all with the ſcapulary Bandage. *See Plate* III. *Fig.* 1. *Lett.* B. C. At every dreſſing the Surgeon ſhould be very cautious in removing the Bandage, Bolſters, *&c.* the Tent ſhould be taken out, and the Patient turned upon the wounded ſide, that, if any Matter is collected in the Cavity, it may be eaſily diſcharged. Where there is a large collection of *Sordes*, it will be proper to prepare a *vulnerary Injection ex Decocto Herbæ Agrimoniæ, Saniculæ vel Hyperici, admixto Roſarum Melle*. This Medicine ſhould be thrown moderately warm into the Cavity of the Abdomen twice or thrice at every dreſſing, turning the Body

afterwards upon the Wound, that the Blood and Matter which are mixed with the Injection may be evacuated with it. Having proceeded in this manner, paſs a new Tent into the Wound, moiſtened with ſome digeſtive Ointment, and dreſs up as before. This method of cleanſing the Parts, and dreſſing the Wounds is to be repeated daily, till there remain no ſigns of any Foulneſs within. After this the Tent may be removed, and the Wound healed after the uſual methods; to forward this Intention, Reſt and proper regulations in Diet are very ſerviceable, adviſing the Patient to lie as much as poſſible upon the Wound, placing a ſoft Pillow immediately under it; for by this Poſture the Matter meets with a more ready diſcharge, and the Lips of the Wound are induced to heal, from conſtant Preſſure.

Another Caſe which requires this Operation.

XVI. Thoſe Wounds alſo require the Suture, which are extended as far as the *Peritoneum*, though they don't break through it into the Cavity of the Abdomen; for in this caſe the *Peritoneum* is in conſtant danger of being too much diſtended, from the vehement Motions of all the Parts of the Abdomen, in breathing, walking, at the Expulſion of the Excrements, *&c.* Upon the Relaxation of this Membrane the Inteſtines would ſoon make their way between the Muſcles, and bring on very bad Symptoms and dangerous *Herniæ*. Theſe Miſchiefs cannot better be prevented than by performing the Operation deſcribed above at *N.* 11, 12, 13. but we muſt obſerve in this caſe, that as the *Peritoneum* is not wounded here, the Needle muſt paſs only through the Muſcles, and common Integuments.

The quilled Suture uſed here.

XVII. The Surgeons, for many Years, performed this Operation of ſtitching up Wounds of the Abdomen with the interrupted Suture, and preferred that to all other methods; but ſeveral amongſt the Moderns, as we hinted above, prefer the quilled Suture in all large Wounds, but more particularly in Wounds of the Abdomen. For as the Muſcles of the Abdomen, above all other Parts, are ſubject to violent motions in breathing, ſneezing, coughing, and from many other cauſes, by which motions the Threads have ſometimes burſt through the Lips of the Wound, and great Miſchiefs have enſued: Some modern Surgeons therefore, and particularly DIONIS, have introduced the quilled Suture again in this caſe, which had been before rejected; but to prevent the Lips of the Wound from ſuffering by the Preſſure of the pieces of Wood which were formerly uſed in this Suture, he ſubſtitutes Rolls of Silk ſpread with ſome Plaſter in their room, as we ſhewed above, *B.* I. *Chap.* I. *N.* 46. and at *Plate* IV. *Fig.* 16. In large tranſverſe Wounds of the Abdomen, which do not paſs through the *Peritoneum*, PALFYNUS adviſes the uſe of this Suture, which is to be performed according to the method I have deſcribed above in the firſt Chapter.

GARENGEOT's Method.

XVIII. GARENGEOT prefers this Suture to all others, even in Wounds that penetrate into the cavity of the Abdomen, and recommends the following manner of performing it. Inſtead of a double Thread, he twiſts ſix or eight ſtrong Threads together, and waxes them well, paſſing them through the Eye of a large crooked Needle, ſuch an one as is deſcribed in *Plate* VI. *at Fig.* 5. *or* 6. The Surgeon takes hold of the Needle at the blunt End with his right Hand, and paſſes the Thumb of his left Hand into the Wound, raiſing the upper Lip with it, whilſt he fixes the Fingers of the ſame Hand upon the external part of the Lip; he then introduces the point of the Needle into the Abdomen, and raiſing it up

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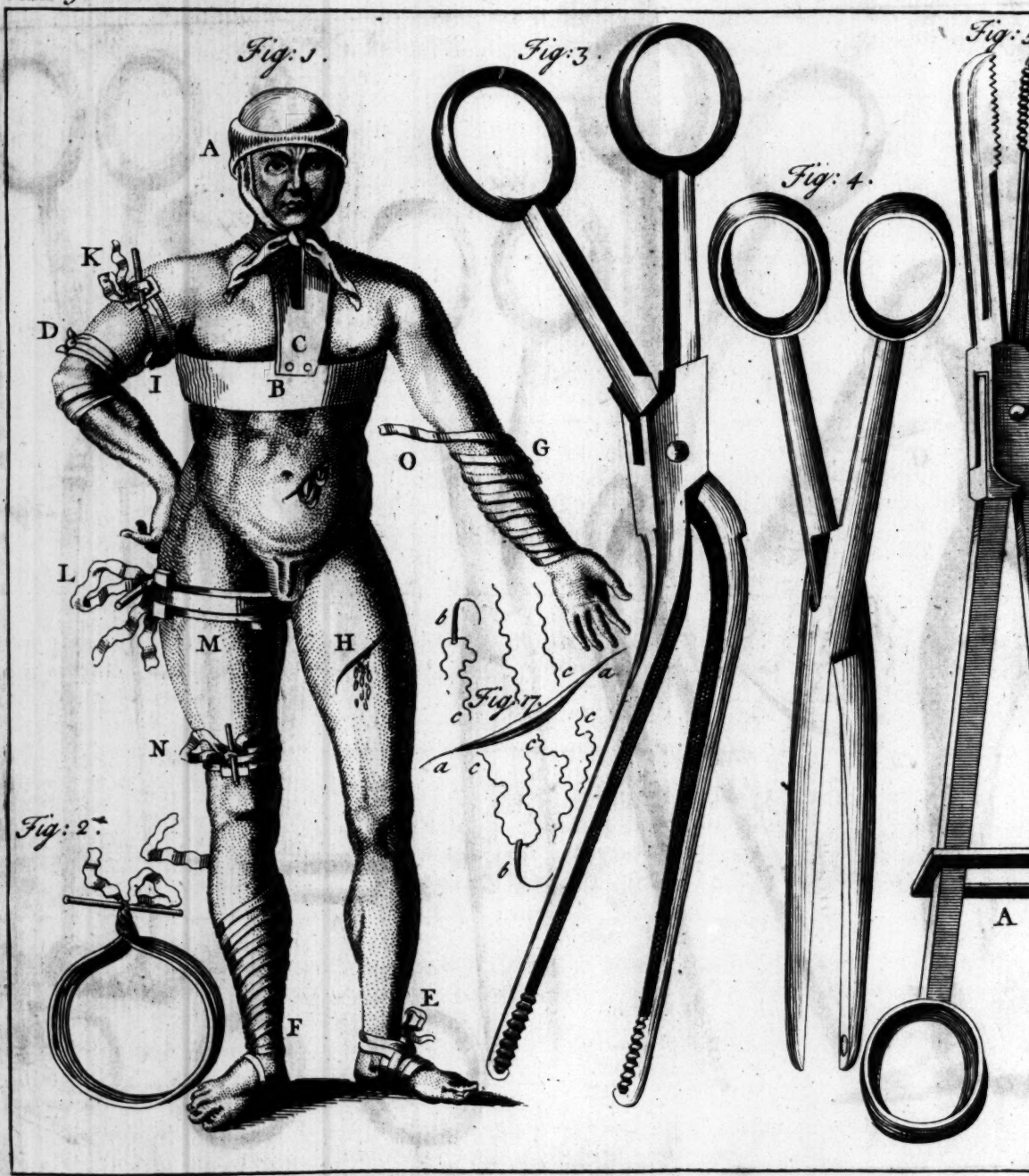
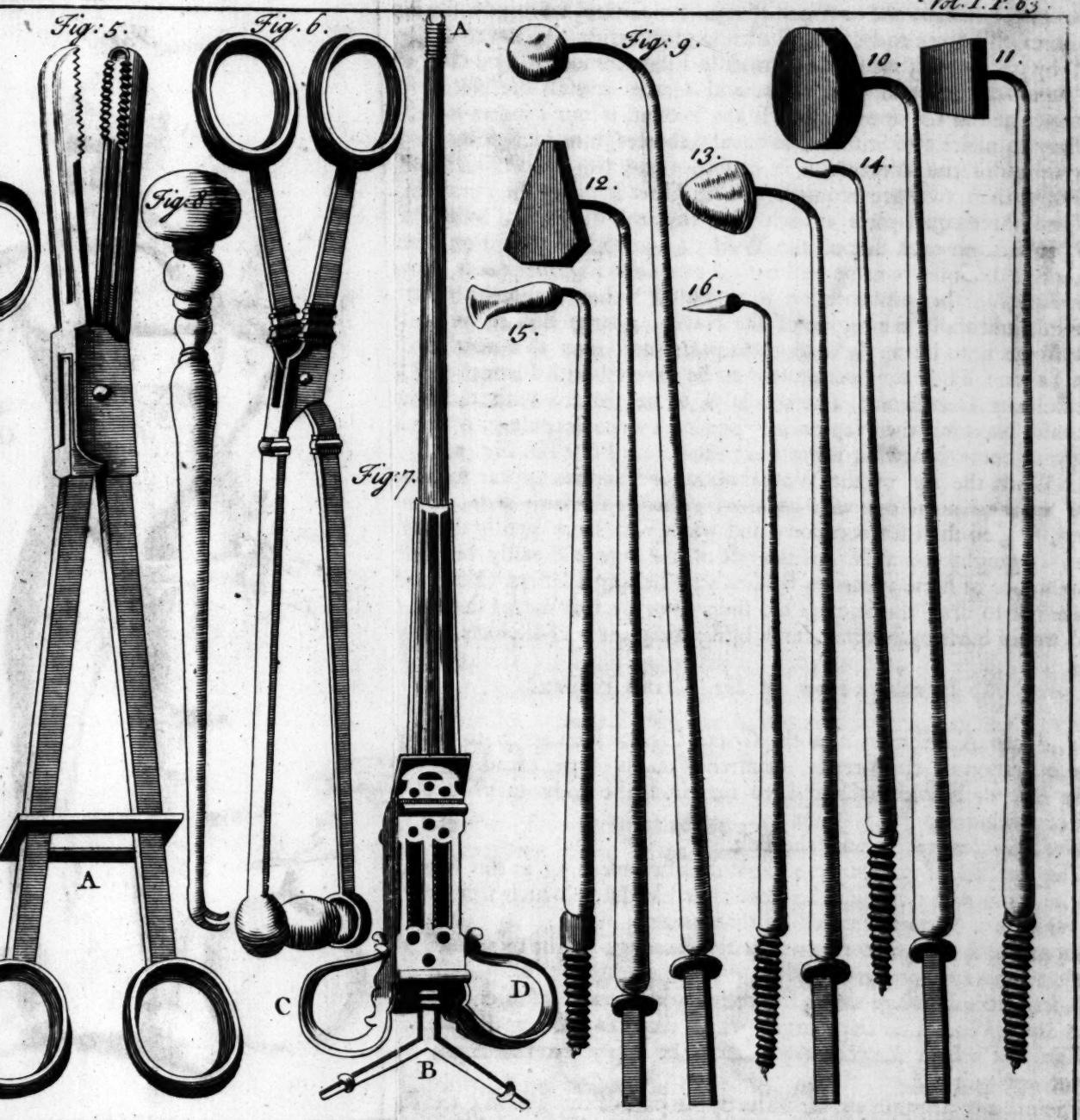
Plate 3.

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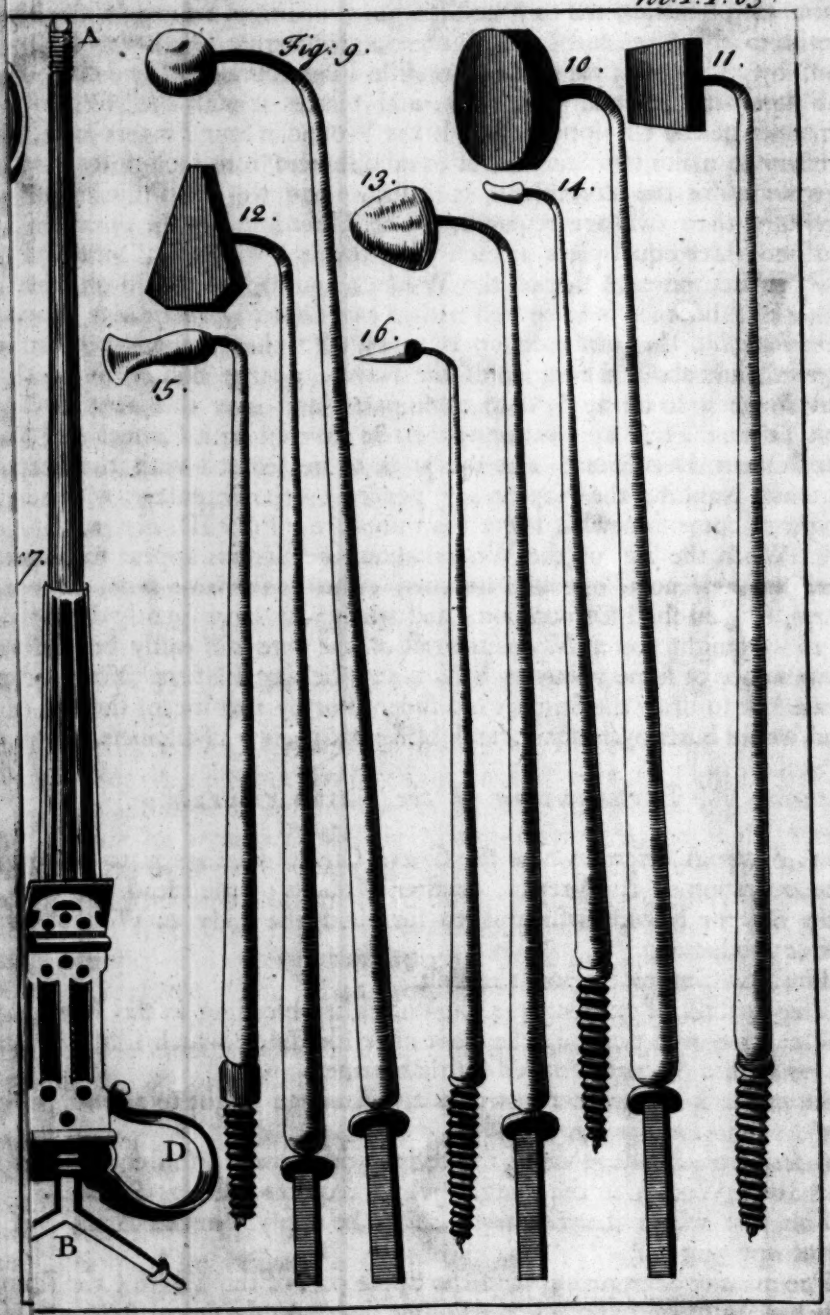
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about two Fingers breadth from the opening of the Wound, pierces through the *Peritoneum*, Muſcles, and common Integuments; then taking off the Needle, he fixes it to the other end of the Thread, and lifts up the lower Lip of the Wound, by introducing his fore and middle Fingers under it, and clapping his Thumb upon the external part of it, and pierces it with the Needle in the ſame manner he did the upper Lip. If the Wound is four Fingers long, it will be neceſſary to make two Stitches, at equal diſtances from each other, and from the extremities of the Wound; if it is leſs, [a] one will be ſufficient, if it is larger, more than two are required. The Threads are to be unravelled and divided into three equal parts at each end, through which the Rolls of Plaſter are to be paſſed, on each ſide of the Wound, and to be faſtened on with bow knots. The Abdomen is to be well bathed *cum Oleo Roſarum calido, pauco Spiritu Vini admiſto*; this embrocation is to be uſed chiefly upon the Parts near the Wound, and about the region of the Navel; a large Bolſter wet with the ſame Medicine is to be apply'd to theſe parts, and over this another dipt *in Oxycrato calido*. Theſe applications are to be covered with Flannel well ſoaked in an emollient Decoction: The whole is to be ſecured with the Scapulary Bandage and Napkin, the Napkin is ſuſpended by the Scapulary, which in this caſe ought to come ſomewhat lower than uſual. *See Plate* III. *Fig.* 1. C.

XIX. When the lips of the Wound about the Sutures appear to be united, you may cut the Knots, one after another, either at the ſame time, or on different Days, as you ſhall ſee occaſion; and when you have gently drawn them away, as we taught you at *N.* 49. the reſt of the cure will eaſily be performed by the aſſiſtance of ſome vulnerary Balſam and ſticking Plaſters. You muſt take great care not to draw the Stitches too ſoon: For by that means the lips of the Wound would burſt open again, and bring on grievous Miſchiefs. How to heal the Wound.

EXPLANATION *of the* THIRD PLATE.

Fig. 1. *Letter* A deſcribes how the *Grand Capital Bandage* is to be apply'd after the operation of the Trepan, or after Wounds of the Head.

B, the *Belt* or Napkin which is to ſurround the Body in Wounds of the Thorax or Abdomen.

C, The *Scapulary* to ſupport the Belt.

D, The method of making the Ligature after bleeding in the Arm.

E, The manner of tying up the Foot after bleeding, which from the ſimilitude it has with a *Stirrup* is called by that name.

F, Shews the ſpiral manner in which the Bandage ought to aſcend, when it is apply'd to the Leg or Arm.

G, A ſerpentile Bandage where the convolutions are not ſo frequent.

H, A large Wound in the Thigh, which requires the true Suture.

K, The part where the *Tournequet* is to be apply'd to the Arm, and the manner of applying it.

L, The manner of applying it to the upper part of the Thigh; the Bandage which is rolled up, and applied as a Bolſter lies upon the crural Artery at M.

[a] GARENGEOT *Operat. Tom.* I. *pag.* 220. *Edit.* 2d. But I wiſh he had been more accurate in deſcribing how the quilled Suture could be performed by one Puncture; for two at leaſt are required to keep the Quills firm.

N, Shews

N, Shews how the *Tournequet* is to be apply'd to the lower part of the Thigh, in which caſe the rolled Bandage is to be apply'd to the back part of the Thigh.

O, A large Wound of the Abdomen, with the Inteſtines falling out.

Fig. 2. The common *Tournequet*, before it is apply'd.

Fig. 3. Crooked Forceps furniſhed with teeth at the end, called the *Crane's Beak.*

Fig. 4. A pair of ſtrait Forceps.

Fig. 5. The *Duck's Bill* Forceps, furniſhing with a moveable ring at the lower end.

Fig. 6. The *Gooſe Bill* Forceps.

Fig. 7. The Inſtrument invented by *Bartholomæus Maggius*, to extract Bullets that are fixed in a bony Part.

Fig. 8. A Hook to extract Bullets.

Fig. 9, 10, 11, 12, 13, 14, 15, 16. different ſorts of Cauteries.

Fig. 17. Shews in ſome meaſure the manner of performing the Operation called *Gaſtrorapby*, or the Suture of the Abdomen. The Letters *aa* deſcribe the Wound; *bb*, two crooked Needles with the Threads hanging to them; *cccc*, two Threads drawn through the lips of the Wound, and cleared from their Needles.

CHAP. VI.

Of WOUNDS *of the Inteſtines, and the manner of ſtitching them up.*

When the Suture of the Inteſtines is to be performed.

I. WHEN a large Wound is made in the cavity of the Abdomen, that not only lets out the Inteſtines, but alſo divides ſome part of them, the Surgeon ought always to ſtitch up the wounded parts of the Inteſtines, before he returns them; by this means we may not only expect the Wound to heal more readily, but the diſcharge of Chyle and Fæces into the cavity of the Abdomen, which would bring on great miſchief, is prevented. And although Wounds of the Inteſtines, eſpecially of the ſmall Guts, admit of little or no hopes of a cure, yet as the great Guts, as *Celſus* obſerves, *Lib.* VII. *Chap.* 16. ſometimes admit of the Suture to advantage, it is better to uſe a doubtful Remedy than none; therefore the Surgeon ſhould never neglect examining whether the Inteſtines are injured, that he may uſe all probable means of healing them. *See above Chap.* V. *N.* 4, 5.

When the Suture is not to be attempted.

II. Small Wounds of the Inteſtines, that don't exceed in Size the diameter of a Gooſe Quill, ſhould by no means be ſtitched, but are beſt left to Nature; if they are left to themſelves, they will frequently unite much ſooner than if they are irritated by the Suture: For ſtitching uſually brings on great Pain, Inflammation and other bad ſymptoms. Therefore it will be much better to return them inſtantly, (*See Chap.* VI. *N.* 5.) and to bleed the Patient to prevent Inflammation, adviſing him to Reſt and Abſtinence.

How the Opening is to be performed.

III. But large Wounds of the Inteſtines; though they ſeldom admit of cure, are to be ſtitched up with *the Glover's Suture*, before the Inteſtine is returned. To perform this, you ſhould be provided with a fine Needle threaded with Silk, an Aſſiſtant ſhould take hold of one part of the Gut, with a fine piece of Linen well

well aired before the Fire; whilſt the Surgeon ſhould hold the other part in his left hand, and ſew up the whole Wound after the Glover's manner, leaving very ſmall ſpaces between each Stitch, to wit, little more than a Mathematical Line. The laſt Stitch ſhould be faſtened with a Knot, but the other end ſhould hang about a foot out of the Abdomen, by which the Silk may be drawn out when the Inteſtine is healed. *See Plate* IV. *Fig.* 20. Some in this caſe prefer the *interrupted Suture*, becauſe it is performed with fewer Punctures, and therefore is not liable to bring on ſo great Inflammation. GARENGEOT propoſes another method of performing *the Glover's Suture*, *in Operat. Chirurg. Artic. de Gaſtrorapbia*. But, to ſay truth, experience ſhews us that very few are ſaved, whatever Suture is made uſe of.

What is to be done afterwards.

IV. After this Operation is performed, the Wound of the Abdomen is next to be taken care of, and ſtitched up as we have ſhewn in the former chapter upon that ſubject, always obſerving the caution I there laid down, of keeping the depending part of the Wound open with a tent, till all the præternatural Fluids are diſcharged from the cavity of the Abdomen, and till the union of the Wound in the Inteſtine, ſhall render it proper to draw out the Silk with which it was ſtitched up.

How the Wound is to be dreſſed.

V. There is no neceſſity for explaining to you the method of cleaning, dreſſing, and healing the Wound; we have already ſpoke ſufficiently on that ſubject in *Chap.* V. *N.* 14. and the following Numbers: Only I would furniſh the Surgeon with this farther caution, that where two Threads hang down from the Belly, one belonging to the end of the Tent, the other to the Suture of the Inteſtine, it will be proper to diſtinguiſh them by different colours, to prevent miſchievous Miſtakes.

An eaſier Method of healing Wounds of the Inteſtines.

VI. As the modern Surgeons have found by experience that ſcarce any are ſaved who have received Wounds in the Inteſtines, and that in thoſe few who do recover, the wounded parts, from the Fineneſs of the Coats of the Gut, do not properly unite, but rather adhere to the inner part of the *Peritoneum*, or to the *Omentum*, or to ſome of the other Inteſtines; it is no wonder therefore that they entirely lay aſide the practice of ſtitching up the wounded parts of the Inteſtine, eſpecially with uninterrupted Stitches, like the *Glover's Suture*, which by the frequency of the Puncture brings on Inflammation, acute Pains, Convulſions, nay ſometimes Cancer or Mortification, and Death itſelf; but they rather chuſe now to deal more tenderly with the Patient, and to ſubſtitute a gentler method of Cure; in conſequence of which, the preſent practice is, to paſs a waxed Thread through a fine Needle, and with this to faſten the wounded part of the Inteſtine to the internal orifice of the Wound of the Abdomen. The Thread that hangs out of the Abdomen is to be ſo firmly fixed by the application of ſticking Plaſters to the Wound, that the Inteſtine cannot recede from the part to which it was faſtened, nor can it evacuate any of its contents into the cavity of the Abdomen. When this operation is well performed, the Inteſtine eaſily adheres to the internal part of the Abdomen, and the Patient ſuffers infinitely leſs pain and hazard, than from the former method of making the Suture. The ſame regulations in Diet, and the ſame methods of dreſſing which we adviſed above at *Chap.* V. *N.* 14. *and the following Numbers*, are to be obſerved. The ſame method of cure will alſo ſerve for Wounds of the Stomach, where they are within the reach of the Hand, and

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it is ſometimes crowned with ſucceſs. *See* BOHNII *lib. de renunciatione Vulnerum, Sect.* II. *Chap.* 5.

EXPLANATION *of the* FOURTH PLATE.

Fig. 1. PETIT's *triangular Needle*, for making a new Aperture in the Part oppoſite to the Wound.

Fig. 2. My improvement upon PETIT's *Needle*, which will take place where a ſtrait Needle cannot ſafely be uſed. *See Book* I. *Chap.* I. *N.* 37.

Fig. 3. A A, repreſents a Wound, the lips of which are to be united by the Sticking Plaſter indented on both ſides at B B.

Fig. 4. Shews a Wound to which two Sticking Plaſters are applied.

Fig. 5. A Wound of the like Nature, to which are applied two Sticking Plaſters without Indentations.

Fig. 6. A Wound made croſs-ways, A A A A, united by two Plaſters laid croſs-ways B B B B.

Fig. 7. A Wound A A, to which a Sticking Plaſter is applied with two openings in the middle B B.

Fig. 8. A Wound united by the application of two Plaſters, with Tapes fixed to each of them, which are drawn together and faſtened with ſlip Knots *a a a a*.

Fig. 9. The ſame Wound with Plaſters of the ſame kind, furniſhed with Hooks *a a a* inſtead of Tapes, by which, with the aſſiſtance of Threads tied to them, the lips of the Wound are drawn together.

Fig. 10. Another method of doing the ſame thing uſed by the Ancients.

Fig. 11. A Tranſverſe Wound A A, united by the *Interrupted Suture* B B.

Fig. 12. Shews in what manner a croſs Wound is to be ſtitched up, and the lips of it brought together by drawing the Threads tight, A B C D.

Fig. 13. Where the Stitches are to be made in a Triangular Wound, A B C.

Fig. 14. How a Wound with two angles, is to be ſtitched with the *Interrupted Suture*, firſt at the angles A A, and then, if it is neceſſary, on each ſide at the Letters B B.

Fig. 15. *A large crooked Needle with a double Thread*, to make the *quilled Suture*. A is the Needle; B the double Thread; C the bow end of the Thread.

Fig. 16. A large Tranſverſe Wound, A A, united by a Triple *uninterrupted Suture* B B B.

Fig. 17. The ſame kind of Wound, which, beſides the Threads at *Fig.* 16. is furniſhed alſo with ſmall cylindrical Rolls of Silk, ſpread with ſome Wax or Plaſter, A A and B B, the Threads on the upper lip of the Wound are tied in ſlip Knots, C C C, whilſt the Roll that lies on the under lip is confined between the bow ends of the Threads E E E: In a word, this ſhews PALFYNUS's method of making the *quilled Suture*.

Fig. 18. Shews you another method of making the *quilled Suture* in large Wounds, particularly in thoſe of the Belly, which is called *Gaſtroraphy*. *See Book* I. *Chap.* V. *N.* 47. *and Chap.* V. *N.* 18. A A the Wound; B B the upper Roll; C C the lower Roll; D D D the ſingle Knots which confine the upper Roll; E E E the ſlip Knots which ſecure the lower Roll.

Fig. 19. CELSUS's *Suture*, which he deſcribes at *Lib.* 7. *Cap.* 16. for performing the Operation of *Gaſtroraphy* with two Needles: But this is a bad method, and

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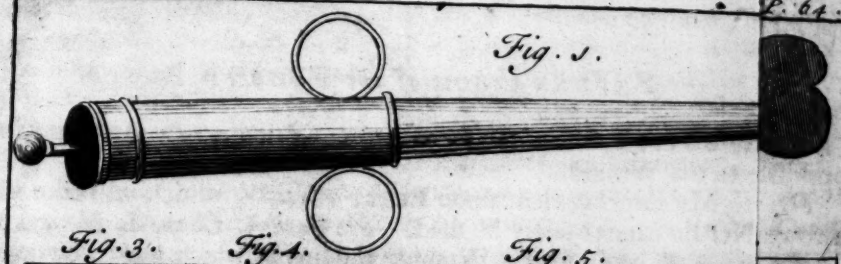

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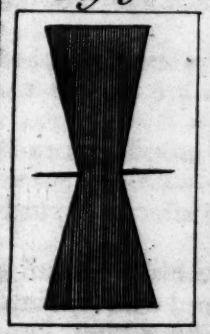

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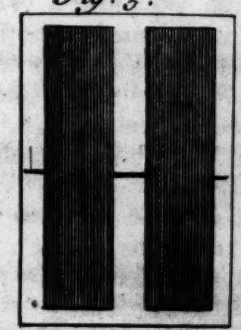

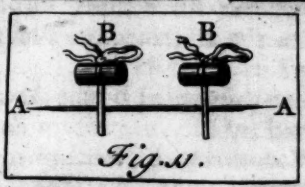

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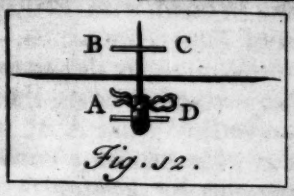

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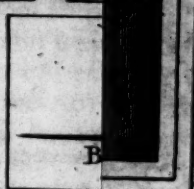

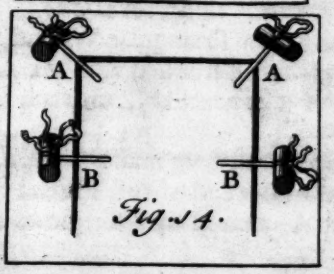

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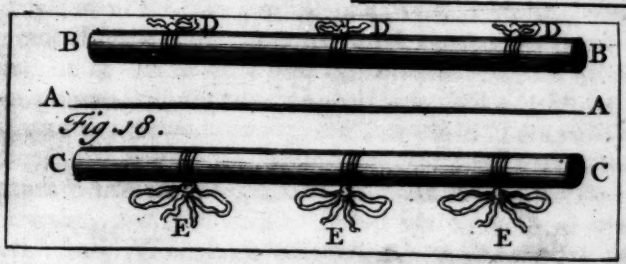

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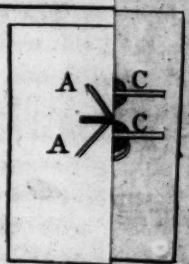

Plate 4.

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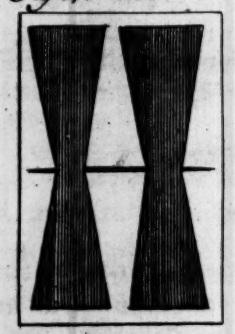
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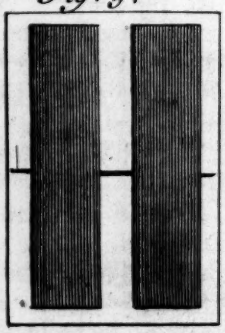
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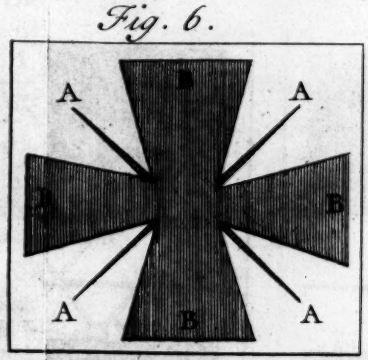
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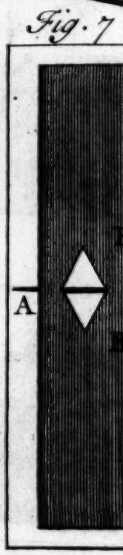
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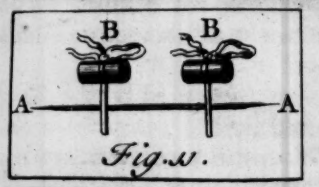
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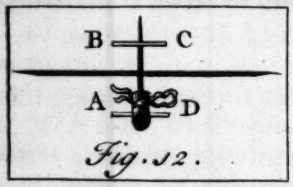
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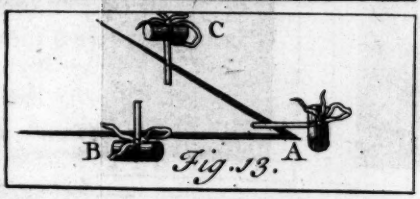
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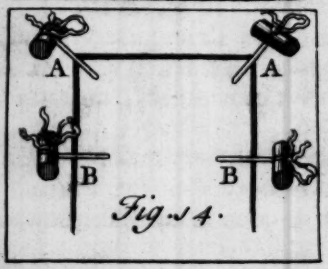
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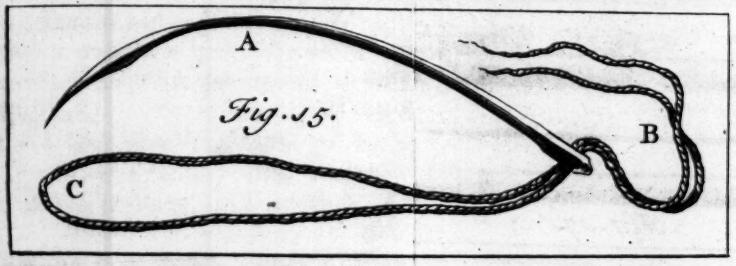
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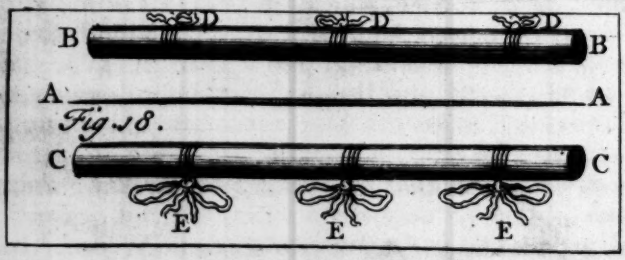
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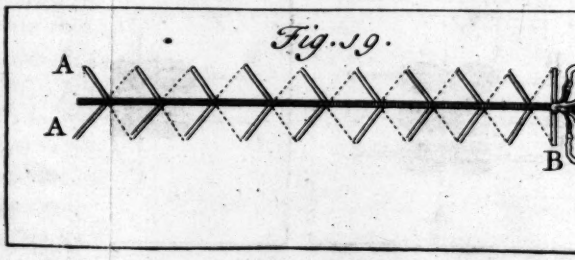
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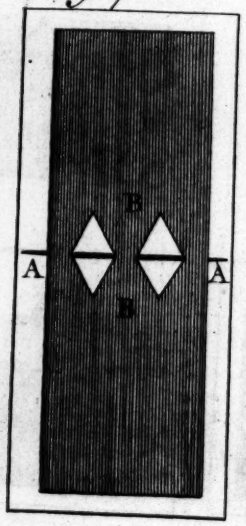
Fig. 2.

Fig. 7



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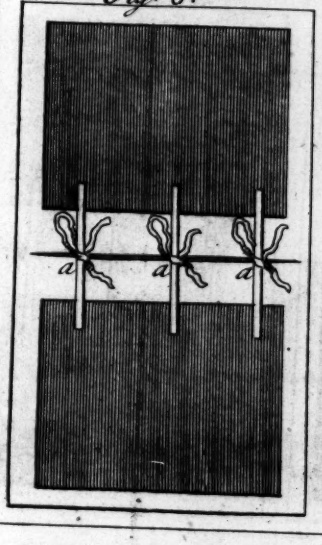

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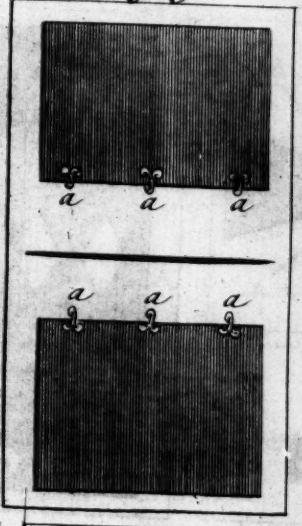

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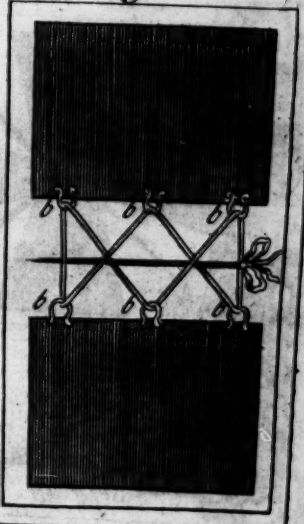

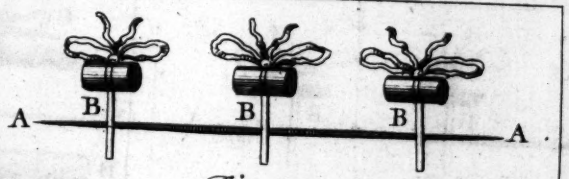

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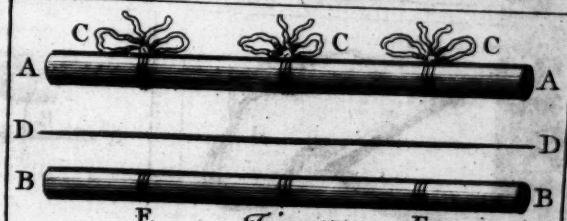
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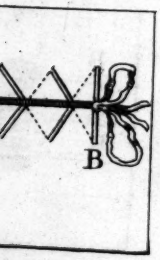
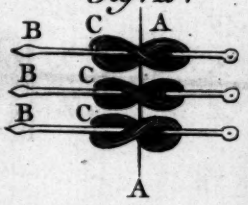


Fig. 20.

Fig. 21.



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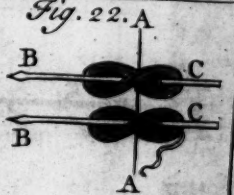

of practice. A A the Stitches; B B the End where they are faſtened in a Knot.

Fig. 20. The *Glover's Suture* uſed for uniting Wounds of the Inteſtines. A A the Inteſtine; B B the Wound; C the beginning of the Suture, with part of the Thread hanging out; D the End of the Suture, where it is faſten'd in a Knot.

Fig. 21, 22. *The Suture for the Hare Lip*, which is made with two or three Needles. A A the Wound; B B Needles paſſed through the Lips of the Wound; C C C the Thread twiſted round the Needles.

CHAP. VII.

Of Loſs of Subſtance in the INTESTINES.

What is to be done when there is a Loſs of Subſtance.

I. WHERE any part of the Inteſtine is carry'd away, the Caſe ſeems to be plainly deſperate; it was therefore wonderful that Perſons thus wounded did not all die upon the Spot, or in the operation of making the Sutures, till [a] *Hildanus*, [b] *Blegny*, [c] *Dionis*, [d] *Palfynus*, [e] *Jo. Maur. Hoffman*, [f] *Schacher*, [g] *Vater*, [h] *Cheſelden*, and others, obſerved that the Lips of Inteſtines ſo wounded would ſometimes quite unexpectedly adhere to the Wound in the Abdomen, and therefore there ſeemed to be no reaſon why we ſhould not take this [i] hint from Nature. Whenever therefore a Surgeon is called to a Caſe of this kind, after he has diligently examined the ſtate of the upper part of the Inteſtine which has ſuffered a Loſs of Subſtance, he ſhould ſtitch it to the external Wound: For by this means the Patient may not only be ſaved from inſtant Death, but there have been inſtances where the wounded Inteſtine has been ſo far healed, that the Fæces which uſed to be voided *per Anum*, have been voided by the Wound in the Abdomen; which, from the Neceſſity of wearing a Tin or Silver Pipe, or keeping Cloaths conſtantly upon the Part to receive the Excrement, may ſeem to be very troubleſome; but it is ſurely far better to part with one of the conveniences of Life, than to part with Life itſelf: Beſides, the Excrements that are voided by this paſſage, are not altogether ſo offenſive, as thoſe that are voided *per Anum*.

How a mortify'd Gut is to be treated.

II. The ſame method of Cure may conveniently enough be put in practice, where any part of the Inteſtine is mortify'd by being forced out of the Abdomen. For in this caſe if you tie up the meſenteric Arteries, the corrupted or mortify'd part of the Inteſtine may be cut off, and the remaining ſound part made to adhere to the Wound of the Abdomen. For it is better to try this method, though but few ſhould be ſaved by it, than to ſuffer all to periſh. I once publiſhed a Cure of this kind in a diſſertation containing various obſervations, printed at *Helmſtadt*.

How concealed Wounds of the Inteſtines are to be treated.

III. When the Inteſtines are wounded, but not let out of the Abdomen, and therefore their Wounds are out of reach, the Surgeon can do nothing but keep a Tent in the external Wound, according to the rules laid down at *Chap.* V.

[a] Obſerv. 74. Cent. I. Obſ. 72. Cent. VI. [b] Zodiac. Med. Gall. An. 2. pag. 123. [c] In Chirurg. cap. de Gaſtroraphiâ. [d] In Chirurg. cap. de Gaſtroraph. [e] Diſq. Corp. Hum. Anat. Path. [f] In Diſſert. de Morb. ex ſitu Inteſtin. [g] In Diſſertat. de Vuln. in Inteſtin. lethal. [h] Lib. de alto apparatu.

[i] A Surgeon try'd this firſt with ſucceſs upon a Dog. See BLEGNY *Zodiac Gall. An.* 2. *p.* 143. afterwards it was performed upon a Man. See *Miſcell. Natur. Curioſ. Dec.* 2. *An.* 8. *Obſ.* 229.

N. 14. and after this bleed the Patient if his ſtrength will admit of it, adviſing him to reſt, and live abſtemiouſly, and to lie upon his Belly; the reſt is to be left to divine Providence, and the ſtrength of his Conſtitution. But the Queſtion may be aſked here, whether a Surgeon may not very prudently, in this caſe, enlarge the Wound of the Abdomen, that he may be able to diſcover the injured Inteſtine, and treat it in a proper manner? Truly I can ſee no objection to this Practice, eſpecially if we conſider that upon the neglect of it, certain Death will follow, and that we are encouraged to make trial of it by the Succeſs of others. SCHACHERUS *in programmate Publico* LIPSIAE *edit.* 1720. mentions a Surgeon who performed this Operation ſucceſsfully. So CHESELDEN of LONDON gives us an Hiſtory where in the *Hernia incarcerata* he laid open the Abdomen, returned the Inteſtines, and perfectly cured his Patient. *See his Treatiſe on the High Operation, pag.* 180. *and his Anatomy,* 3d *edit. page* 283.

Of Clyſters in this caſe.

IV. But what Aſſiſtance are we likely to receive from Clyſters in Wounds of the Inteſtines? Some Phyſicians are very high in their commendation, whilſt others of equal credit abſolutely prohibit the uſe of them. For my own part, I ſee no reaſon for carrying either prejudice to ſo great a length. The uſe of Clyſters is very prudently forbid in Wounds of the great Guts; but no leſs Judgment is ſhewn in preſcribing them in Wounds of the ſmall Guts. In the firſt Caſe the Clyſter will make its way through the Wound, into the cavity of the Abdomen, to the great detriment of the Patient; whereas in the latter they will always prove beneficial; for the Inconvenience which attends the other, is prevented in this caſe by the Valve of the *Colon*; and the Benefits that accrue from this Application are very obvious, the uſeleſs Fæces are carry'd off, an æquable Courſe of the Blood is reſtored, the Fever and Inflammation are much abated by it, if not entirely taken off, and the Pains greatly aſſwaged.

CHAP. VIII.

Of the falling down of the OMENTUM.

Falling down of the *Omentum.*

I. IN large Wounds of the Abdomen, the *Omentum* will frequently protrude itſelf through the Wound either alone or with ſome Portion of the Inteſtines: Whenever this is the caſe, the Surgeon's firſt enquiry is, whether the protruded part preſerves its heat, moiſture and natural colour? If it is not found faulty in any of theſe circumſtances, it muſt be gently returned; but where the ſtraitneſs of the Wound forbids this, the protruded part muſt be taken off cloſe to the Wound, and the Wound healed according to the common form: The *Omentum* in this caſe will adhere to the internal Part of the Wound, without bringing any Diſorder upon the Patient. But where the Inteſtines fall out at the ſame time, the *Omentum* is to be fomented, by an Aſſiſtant, with warm Milk and Water, till the Inteſtines are returned.

What is to be done when the *Omentum* is corrupted.

II. If any part of the protruded *Omentum* is cold, dry, livid, mortify'd, or putrid, the diſcoloured corrupted part muſt be entirely cut off before the reſt is returned, leſt the neighbouring parts ſhould be brought into conſent; which would inevitably prove fatal to the Patient.

How the corrupted part is to be taken off.

III. The corrupted part of the *Omentum* may be taken off in this manner: Take a waxed Thread, paſs it two or three times round the ſound part of the

Omentum

Omentum near the place where it is injured, and faſten it with a Knot, to prevent any Hæmorrhage enſuing after the reduction of it; when you have made a ſecure Ligature, take off the corrupted part with the Knife or Sciſſars, and return what remains ſound, leaving at leaſt the length of a Foot of the Ligature hanging out of the Wound in the Abdomen, till it ſlips off from the ſound part of the *Omentum*.

IV. What remains with regard to the cure of the Wound is ſufficiently treated of above at *Chap.* V. *N.* 14. *and the following Numbers.* The depending part of the Wound ſhould be kept open with a large Tent, ſuch an one as is deſcribed *Plate* II. *Lett.* O. that a paſſage may be left for an Evacuation of the *Sordes* from the Cavity of the Abdomen. It will be proper to give two different colours to the Thread that hangs from the Tent, and that which belongs to the Ligature of the *Omentum* to prevent Confuſion, as we adviſed above *Chap.* VI. *N.* 5. How the Wound is to be dreſſed.

V. At every Dreſſing, after the firſt ſix or ſeven Days, you may draw the Thread which hangs out of the Abdomen gently forwards, till it ſhall by degrees ſlip quite off the *Omentum*: But this ſhould be done without any Violence. When the Thread is drawn out, and you can perceive no diſcharge from the Cavity of the Abdomen, you may remove the Tent, and uſe proper means to heal the external Wound. How the Thread is to be drawn out.

VI. What ſhall we ſay to the unwarranted opinion of DIONIS? Who adviſes Surgeons never to take off any part of the *Omentum*, but rather to follow the Example of MARESCHALL, *firſt Surgeon to the French King*, who, according to our Author's account, has very frequently returned the *Omentum* without making either Ligature or Inciſion, and never ſaw any bad conſequence from this Practice. But I will venture to pronounce this relation of DIONIS's to be very faulty, and not delivered with that accuracy which is required in a matter of fact of this conſequence. We cannot learn by this account of his, whether the *Omenta* which were returned in this manner by MARESCHALL, were large or ſmall, whether they were entirely ſound, or corrupted in part. If they had received no Injury, DIONIS ſpent his time idly, when he ſo earneſtly intreats all Surgeons to follow the Steps of MARESCHALL in this Point: No body ever adviſed the contrary. But if they were in part corrupted or mortified, which DIONIS does not aſſert, it is much to be admired that the Patients felt no inconvenience from this Practice, and what became of the corrupted parts after they were returned, is to me matter of great wonder. Therefore DIONIS is by no means to be attended to upon this point, till he ſpeaks to it in a clearer manner; and more particularly ſo, becauſe PALFYNUS gives us the hiſtory of a caſe, in his Surgery, where MARESCHALL made a Ligature upon the *Omentum*, and ſeparated the corrupted Part from the ſound, before he returned it; and this he declares to be the practice of Surgeons of the firſt name in PARIS. DIONIS's advice in this caſe.

VII. GARENGEOT declares himſelf of the ſame ſentiments with DIONIS, though he makes no mention of his name. This author is far from being clear in deſcribing how large a Portion of the *Omentum* was affected, which MARESCHALL or any other, returned, without Injury to the Patient. I do not deny but that a very ſmall Portion of the *Omentum* may be digeſted in the Abdomen without bringing on any conſiderable miſchief, but I can by no means be perſuaded that this can ever be the caſe, when a large Portion of the *Omentum* is affected, except I ſhould be confronted with many inſtances of it. If by chance one in- GARENGEOT's advice.

ſtance ſhould be produced, this will not put the matter out of doubt, much leſs ſerve as an example worthy of imitation. For miraculous events happen now and then in very dangerous Wounds: And ſince grievous ſymptoms are brought on by letting *Sordes* remain even in external Wounds, what may we not fear from the ſame incident in internal Wounds, from whence they cannot poſſibly be diſcharged? A large degree of Suppuration is to be expected when a large Portion of corrupted *Omentum* is returned into the body; but when a Ligature is made upon the *Omentum*, and the corrupted Part ſeparated from the ſound, no ſuch accident can happen; the Suppuration in this caſe will be very inconſiderable, and the ſmall quantity of matter that is made after reduction, will be eaſily diſcharged through the external Wound that is kept open for that purpoſe by a Tent; whereas GARENGEOT forbids the uſe of Tents promiſcuouſly, and adviſes you to heal the Wound as ſoon as poſſible. I am of opinion, therefore, that you ſhould very carefully diſtinguiſh between a great and ſmall degree of Suppuration, becauſe this is of greater conſequence than GARENGEOT ſeems to imagine. Since this matter is left doubtful, and GARENGEOT no where pretends to have had experience of the good effects of the practice which he eſpouſes; but on the other hand, PALFYNUS who was an Eye-witneſs contradicts him, I think we may very ſafely imitate the Examples of many excellent Surgeons, in making a Ligature upon the *Omentum*, and ſeparating the corrupted Parts of it from the ſound, before we attempt to return it into the Abdomen.

CHAP. IX.

Of WOUNDS *of other Parts of the* ABDOMEN.

IF you can diſcover by your Eye, or by the Touch, that any other Part or *Viſcus* ſituated in the Abdomen, ſuppoſe the Liver, Spleen, or Kidney, has received a Wound from a ſharp Inſtrument, it will be adviſeable at the firſt Dreſſing, to fill the Wound as tenderly as poſſible, with a good quantity of Lint, well ſaturated with high rectified Spirit of Wine, or Spirit of Turpentine, ſecuring the Dreſſings with Compreſſes and Bandage; by this means the Hæmorrhage will be ſtopped, if no large Blood-Veſſel is divided. When you have gained this point, the Wound may be treated according to the Rules we laid down for the treatment of Wounds of the Abdomen. What remains muſt be left to God's Providence, and the ſtrength of the Patient's Conſtitution. During the Cure, the Patient muſt be conſtantly kept ſtill and low; if he is of a Plethoric Habit of Body it will be proper to bleed him, to prevent Inflammation, and freſh Effuſions of Blood, preſcribing him alſo vulnerary Potions, and giving him daily two or three Doſes of *Lucatellus*'s or *Meibomius*'s *Balſam*; for theſe Balſams are of great Efficacy in healing internal Wounds. In hidden Wounds of the Viſcera, that are not to be diſcovered by the Eye or by Feeling, all you can do is to take proper care of the external Wounds, daily injecting a vulnerary Decoction, and keeping open a free paſſage for the Evacuation of grumous Blood and Matter from within, ordering the ſame Regimen to be obſerved both with regard to Medicine and Diet, which we adviſed above, and leaving the reſt to Nature; for Art can give no farther aſſiſtance.

EXPLA-

Plate 5.

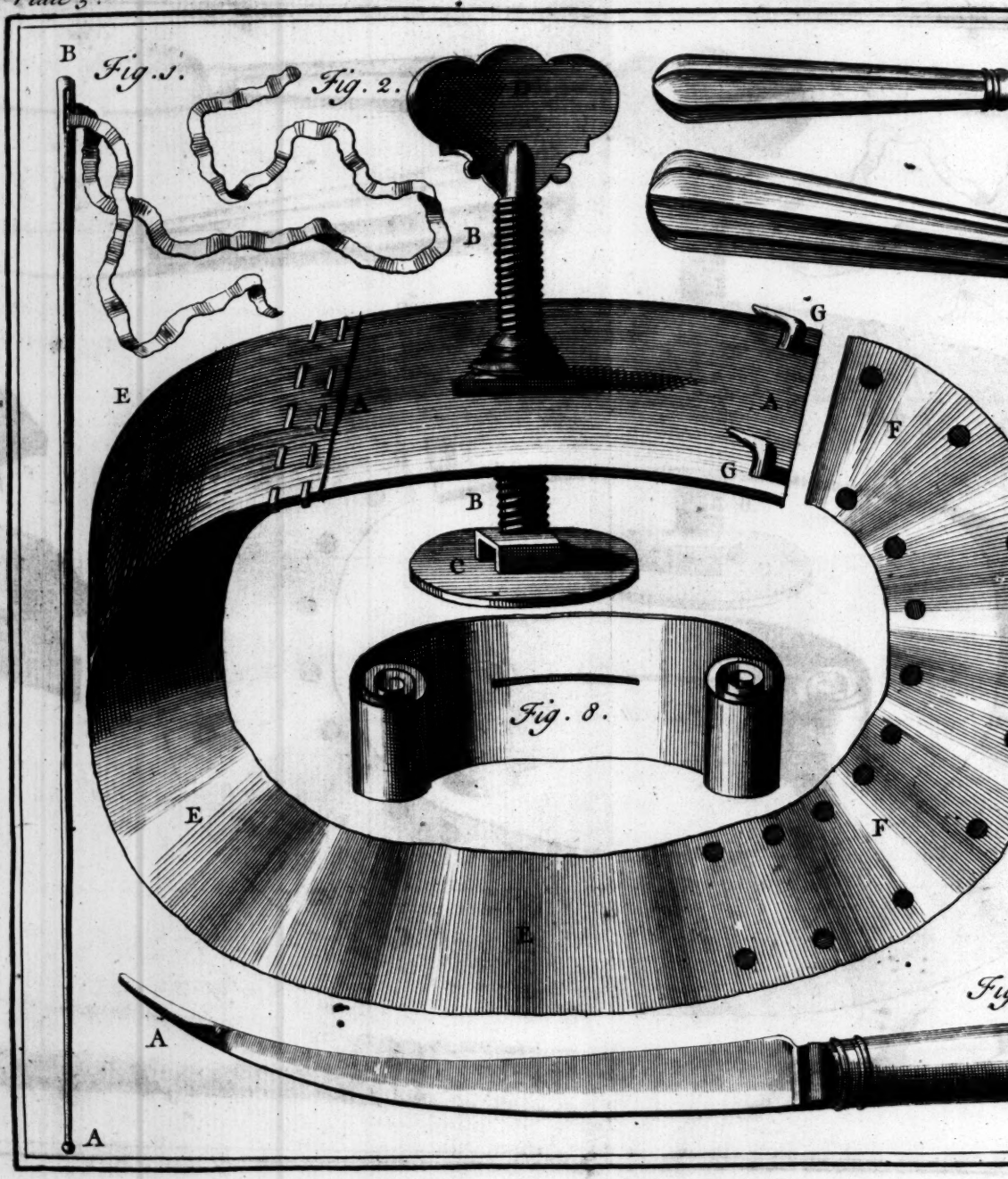

Fig. 4.

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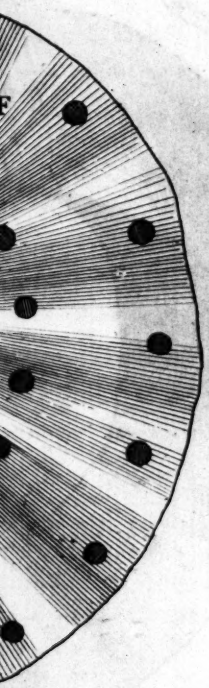

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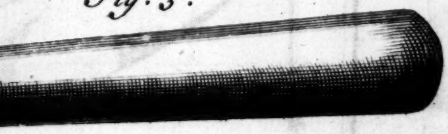

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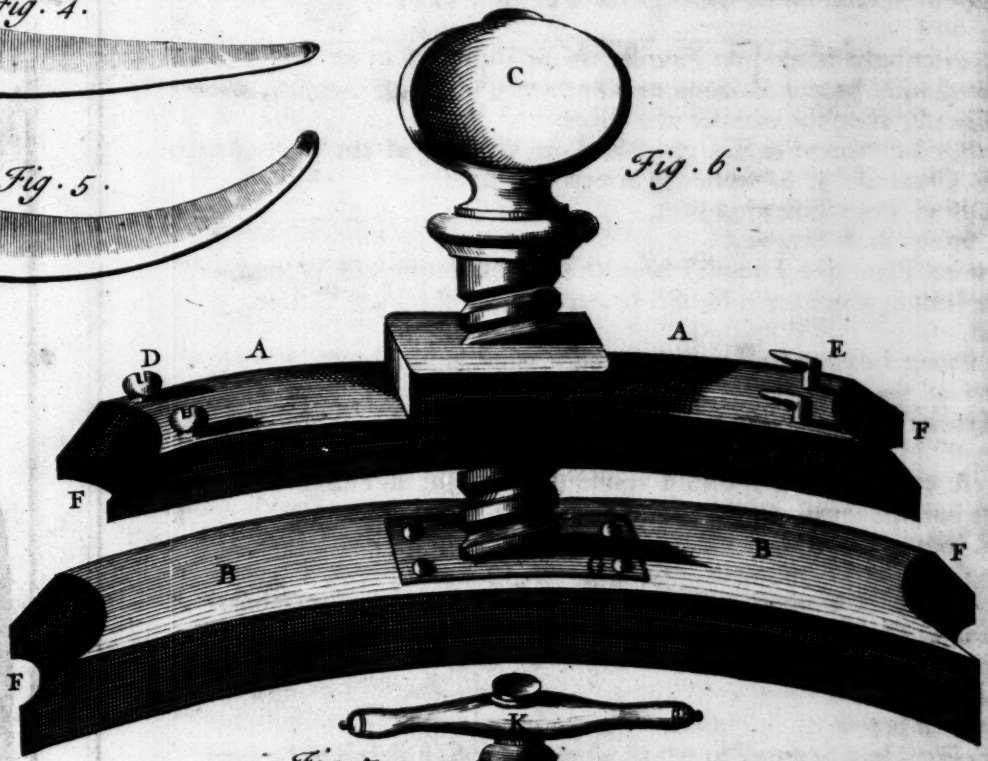

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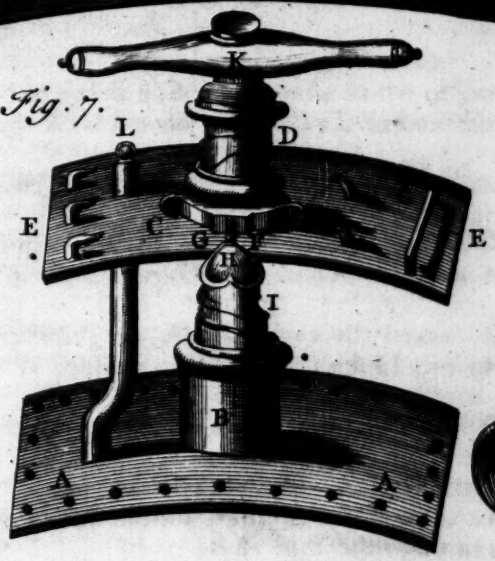

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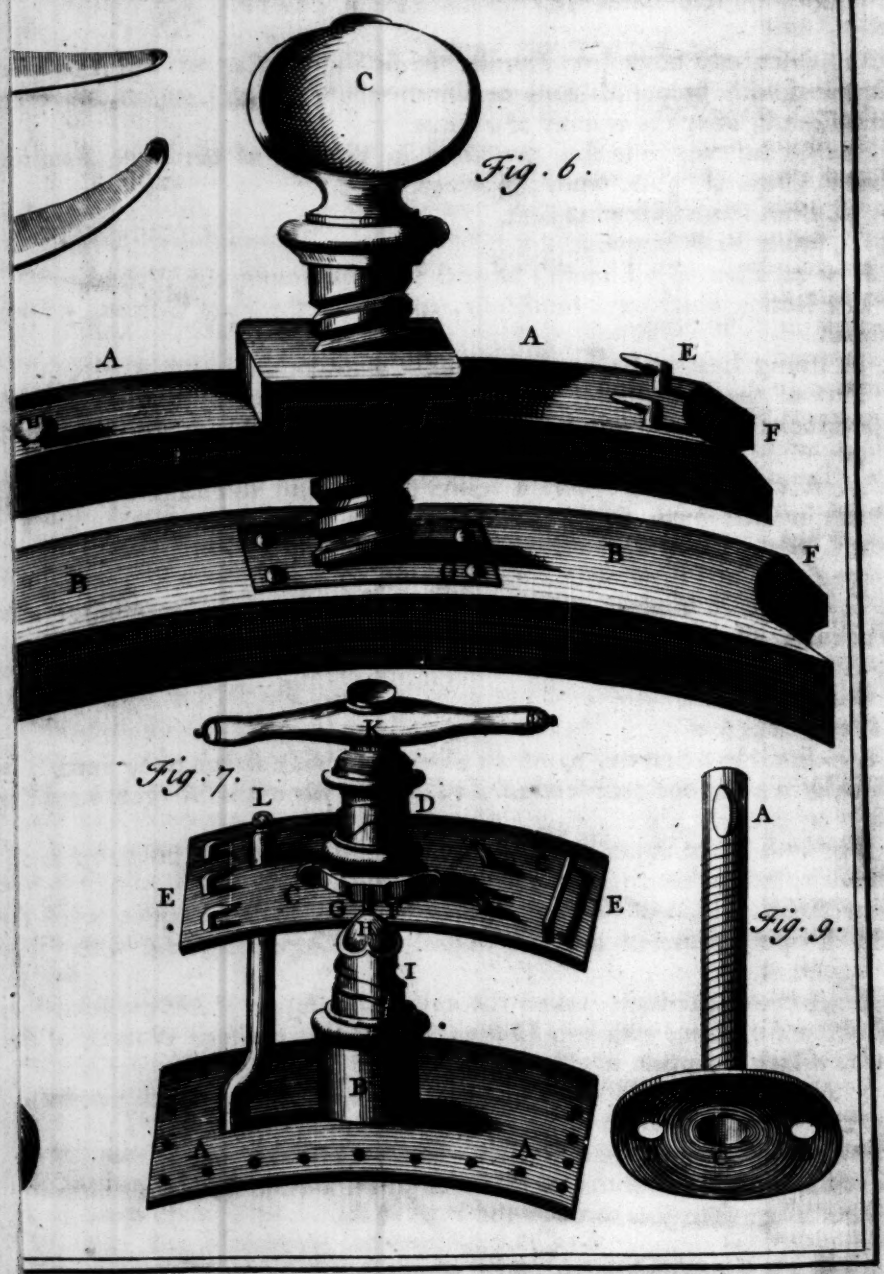

Fig. 6.

Fig. 7.

Fig. 9.

EXPLANATION *of the* FIFTH PLATE.

Fig. 1. deſcribes a blunt Iron Needle, to paſs a fine Rag or Skein of Silk, well ſaturated with proper Balſams or Ointments, through *Gun-ſhot*, or other *pervious Wounds*, after the manner of a *Seton*.

Fig. 2. An Inſtrument to ſtop the Blood in Wounds of the large Arteries, deſcribed in *Chap.* II. §. 8. from our Amendment.

AA, A Braſs Plate ſomewhat bent.

BB, A ſtrong Braſs Screw.

C, A round Plate of a Thumb's breadth to be fixed upon the Wound.

D, The Button which turns the Screw, and preſſes the Plate C ſtrongly upon the Wound.

EE, A ſtrong Leather Belt to ſurround the wounded Part.

FF, Part of the Belt pierced with ſeveral Holes, by which it may be fixed upon the Hooks GG, and lengthened or ſhortened according to the ſize of the Limb.

Fig. 3. A crooked Knife, with a round blunt Point, to enlage Wounds of the Thorax or Abdomen, where that Operation is required.

Fig. 4. A ſtrait Knife with a Button on the Point.

Fig. 5. A crooked Knife with a blunt Point.

Fig. 6. A wooden *Tournequet* in its proper ſize, after our Amendment, deſcribed above at *Chap.* II. §. 12.

AA, The upper Part.

BB, The lower Part.

C, The great Screw.

D, Two ſmall Iron Screws, to which a Leather or Silk Belt is to be fixed.

E, Hooks to faſten the other end of the Belt on, when it is brought round the Limb.

FF, The ends of the upper and lower Part of the Inſtrument hollowed to receive the Belt, and to keep it ſteady in its ſituation.

Fig. 7. Another kind of *Tournequet* made of Iron; the Deſcription is leſs by half than the proper ſize of the Inſtrument. *See Chap.* II. §. 14. where it is largely treated of.

Fig. 8. A broad Bandage, called the *uniting Bandage*; this is perforated in the middle, and rolls up with two Heads; it is uſed in dreſſing Wounds of the Abdomen, which are made lengthways.

Fig. 9. A flexible Silver Pipe, uſeful to diſcharge the Matter which is collected in Wounds of the Thorax, or in the Empyema.

A, The Openings at the Extremities, and on both Sides.

B, The Plate round it, with two Holes to paſs a Thread through.

C, The Paſſage that goes through the Pipe to A.

CHAP.

CHAP. X.

Of WOUNDS *of the* THORAX.

Wounds of the Breaſt of three Sorts.

I. WOUNDS of the *Thorax* are divided into three Sorts: The Wound is inflicted either upon the external Parts of the *Thorax* only, or elſe it penetrates into the Cavity of the *Thorax*, without injuring any of its Contents; or laſtly, the Contents of the *Thorax* alſo partake of the Wound.

How to diſcover whether the Wound is terminated in the external Parts.

II. You may diſcover that the Wound terminates in the external Parts, and does not penetrate into the Cavity of the *Thorax* by ſeveral methods; 1. By the Sight. 2. By the ſenſe of Hearing; by which you will diſcover whether any Sound proceeds from the Wound at the time of Inſpiration. 3. By Feeling, when your Finger or the Probe meets with reſiſtance, if you attempt to paſs it into the Cavity of the *Thorax*. 4. By injecting warm Water, which in this caſe will return ſtrongly upon you. 5. By the Abſence of bad Symptoms, ſuch as difficulty of breathing, fainting, ſick Fits, *&c.* which always attend a Wound that penetrates. When by theſe methods of examining, you are fully ſatisfied that the Wound does not penetrate, you may dreſs it with a digeſtive Ointment, or ſome vulnerary Balſam, and treat it according to the methods which we have adviſed above for the Cure of ſlight Wounds.

What deep and oblique external Wounds of the *Thorax* occaſion.

III. It ſometimes happens that external Wounds run very deep and obliquely between the Muſcles and the Ribs, and are thereby rendered very difficult to be cleanſed from grumous Blood and Matter; the confined Matter in this caſe frequently deſtroys the neighbouring Parts, and produces Ulcers and incurable Fiſtulæ; nay, ſometimes it makes its way through the *Pleura* into the Cavity of the *Thorax*, and forms an *Empyema*, or brings on a *Phthiſis*, or Death itſelf.

How they are to be treated.

IV. The Surgeon's chief buſineſs in this caſe, is to clear the Sinuſes from the Blood and Matter confined in them; this is to be done either by Preſſure, or by ordering the Wound to be ſucked by an healthy Perſon; by drawing it out with a Syphon, or by making further Openings with the Knife. The reſt of the Cure is to be performed after the ſame manner which we deſcribed above; the moſt proper Bandage for ſecuring the Dreſſings is the ſcapulary with the Girdle.

How to empty the Wound with a Syringe.

V. The *Syringes* that are uſed in this caſe are of very different ſhapes and ſizes, ſome are ſtrait, others crooked. Some Surgeons uſe a Tin Syringe reſembling that which we have deſcribed at *Plate* VI. *Fig.* 8. but twice as large; the mouth of it is larger than the reſt of the Syringe, and is of a triangular, round, or oval Figure. *Fig.* 9. repreſents the true ſize of it. When you apply this Inſtrument you muſt clap the mouth of it to the Wound, and by drawing back the handle, endeavour to fill it with Blood: The Inſtrument ſhould have ſeveral heads of different ſizes and figures, that it may correſpond with any Sort of Wound: But concerning the excellency and uſe of theſe Syringes, it will be worth your while to conſult ANELLE in his Treatiſe called *l'Art de Succer les Playes*.

How to diſcover if the Wound penetrates the Cavity.

VI. You will diſcover the Wound to penetrate into the Cavity of the *Thorax*; 1. By the Sight, when you can plainly ſee into the Cavity. 2. By the ſenſe of feeling, when you can paſs your Fingers or Probe into the Cavity. 3.

By

By the Hearing, if the Patient makes a particular Sort of noiſe in drawing his Breath. 4. From the action of the Air of the Lungs upon the Flame of a Candle, or Feathers when they are held near the mouth of the Wound. 5. By warm Water meeting with no reſiſtance, when it is injected into the Wound. 6. Laſtly, from the ſudden appearance of violent Symptoms, ſuch as difficulty of Breathing, Sickneſs, Fainting, *&c.* which are brought on by the Preſſure which the Lungs are ſenſible of from the external Air, from a collection of Blood in the *Thorax*, or from both cauſes together.

What proceeds from a Collection of Blood in the *Thorax*.

VII. When a large quantity of Blood is ſpilt, and falls into the Cavity of the *Thorax*, which muſt ſometimes be the caſe, the expanſion of the Lungs, the office of Reſpiration, and the courſe of the Blood through the Lungs will certainly be impeded, and the Blood by frequent delays and obſtructions being entirely inſpiſſated in the Lungs, Life can no longer be ſupported; but where the quantity of extravaſated Blood is not large enough to obſtruct the Lungs in their office, the chief danger that the Patient labours under, is, that the extravaſated Blood ſhould putrify by degrees, and corrupt the Diaphragm, Pleura, or Lungs, which will bring on very bad Symptoms, and in a ſhort time Death.

Symptoms of extravaſated Blood in the *Thorax*.

VIII. The following Symptoms diſcover an Extravaſation of Blood in the *Thorax*. If, 1. There is a great difficulty of breathing, except when the Patient is placed in an erect Poſture. 2. If the Patient lies eaſieſt upon his Back or wounded ſide, but finds any other Poſture exceeding troubleſome, or ſometimes impracticable. 3. If he feels a Weight upon the Diaphragm. 4. If he perceives the Undulation of a Fluid upon turning the Body round. And, 5. laſtly, if there has been little or no diſcharge of Blood by the Wound.

How to get the Blood out of the *Thorax*.

IX. When it appears by theſe Symptoms that there is a collection of Blood in the *Thorax*, we muſt uſe our utmoſt diligence to get it out, leſt it ſhould lay a Foundation for great Miſchief. Therefore, 1. when the Wound is inflicted upon the middle, or lower Part of the *Thorax*, and has not a very narrow opening, it will be convenient to lay the Patient upon the [a] wounded ſide, adviſing him to fetch his Breath as deep as he can, or to cough. If the current of Blood is obſtructed by any thick grumous Parts, which will ſometimes ſtop up the Orifice of the Wound, they muſt be removed with your Finger, or with the Probe, or drawn out with a Syringe. 2. If you are called ſo late that the Blood is become too thick to flow out of the Wound, you will be obliged to uſe an attenuating Injection, which may be made of a Decoction of Barley, with the addition of ſome common Honey, or Honey of Roſes, and a ſmall quantity of Soap; this is to be injected into the Cavity of the *Thorax*, and then the Patient is to be ſo ſituated as to let it run out again; this Operation is to be repeated till it appears that all the grumous Blood is waſhed away. The Syringe which you will ſee deſcribed in *Plate* VI. *Fig.* 8. with the Pipes, *Fig.* 10, 11. will execute this Intention very properly. 3. But if the Wound is ſo narrow or oblique that this method cannot be proſecuted, the Wound ſhould be enlarged either with the common Inciſion Knife and Director, or with one of the Knives deſcribed at *Plate* V. *Fig.* 3, 4, 5. This caution is always to be obſerved, that

[a] DIONIS in his *Surgery* relates a caſe of this kind, where he left his Patient all Night inclined upon the Wound without dreſſing him, and he afterwards recovered him. DE LA MOTTE confirms this by an inſtance he gives us of the ſame kind, that occurred to him in his Practice. *See his Obſervationes Chirurgicæ.*

is,

is, to be very careful not to fatigue the Patient too much, by endeavouring to diſcharge all the extravaſated Blood at one time; if the Patient is very weak, it is better to do it at proper Intervals, eſpecially if you diſcover any tendency in him to Swoonings. It will be neceſſary in the mean time to keep the Wound open by introducing a Leaden or Silver Pipe into the Wound, ſuch as are deſcribed at *Plate* II. *Lett.* Q, R, S. or rather that flexible one at *Plate* V. *Fig.* 9. though ſome inſtead of a Pipe uſe a Tent with a long ſtring at the end of it, dreſſing up with proper Plaſters and Compreſſes, ſecuring the whole with the Scapulary, repeating this method of dreſſing till the diſcharge ſhall entirely ceaſe, and the external Wound can be conveniently healed.

How the Blood is to be diſcharged when the Wound is in the upper Part of the *Thorax*.

X. When a Wound is made in the upper Part of the Breaſt, or between the upper Ribs, then the method we have preſcribed of turning the Patient upon the wounded ſide, will be of very little ſervice in diſcharging the extravaſated Blood; for no Poſture will ſatisfy this Intention in this caſe but ſtanding upon the Head. An opening ought therefore to be made in the lower Part of the *Thorax*, which Operation the Surgeons call the *Paracenteſis*: The opening is to be made between the ſecond and third Rib, counting upwards, if it is on the left ſide; but on the right ſide between the third and fourth, about a Hand's breadth from the Spine. The Place where you intend to make the opening ſhould be marked with Ink: The Inſtrument that is generally uſed upon this occaſion is called a *Trocar*; it ſhould be driven above the Rib into the *Thorax*, with great caution and gentleneſs; after it has penetrated, draw out the Steel Inſtrument, leaving in the Pipe, through which it was conveyed, as a Channel for the Blood to paſs off by; but if it does not readily paſs, its evacuation may be forwarded by the ſuction of a Syringe. But as the Lungs are very liable to be wounded by paſſing this Inſtrument forcibly into the Cavity of the *Thorax*, it is beſt, in my opinion, to divide the common Integuments, Muſcles and Pleura, with an Inciſion Knife, carefully avoiding the Lungs, which are very apt to adhere to the Pleura in this Part. When the Perforation is properly made, it is to be kept open in the manner we have already ſhewn, and the Wound above is to be healed as ſoon as poſſible.

What is to be done when the Lungs adhere.

XI. As the Lungs frequently adhere to the Pleura, the Perforation of the *Thorax* requires great Circumſpection in the Surgeon: The Pleura ſhould be divided with all poſſible Tenderneſs, and when that is done, the Surgeon ſhould examine whether the adheſion of the Lungs may not ſafely be removed with his Fingers or the Probe. When the adheſion is very firm, the Pains we have taken to perforate the *Thorax*, and to diſcharge the extravaſated Blood, all prove fruitleſs.

How Wounds of this kind are to be treated.

XII. The Cavity of the *Thorax* being thus cleanſed, the Wound is to be dreſſed but once every day; each Dreſſing ſhould be performed with all poſſible expedition, and the utmoſt diligence ſhould be uſed to guard the contents of the *Thorax* from the external Air. At the time of dreſſing a chafing-diſh of hot Coals ſhould be held near the Wound, to warm and thin the Air; and if too great a quantity of Air is already got into the Cavity of the *Thorax*, it muſt be drawn out with a Syphon. This being rightly performed, the Wound is to be dreſſed up with the utmoſt expedition.

If any of the Contents of the *Thorax* are wounded.

XIII. When any of the contents of the *Thorax* are wounded, as the Heart, the Aorta, the Vena Cava, the Pulmonary Artery or Vein, the Mediaſtinum,

or

or a large Portion of the Lungs, Death comes too ſuddenly to give the Surgeon room to exerciſe his Art. On the other hand, when the Lungs are only ſlightly wounded, that is, when only the ſmaller ramifications of the Pulmonary Vein, and Aſpera Arteria are divided, the caſe is very dangerous, but not always mortal; though Perſons who recover after Wounds of this kind, are more obliged to the Soundneſs of their own Conſtitutions, than to their Surgeon's Skill.

Signs of a Wound in the Lungs.

XIV. We may reaſonably apprehend that the Lungs are wounded, when the Patient voids a great quantity of frothy Blood by the mouth, accompanied with a Cough, eſpecially when at the ſame time the Blood which is voided at the Wound is very florid, and the Patient makes a particular Noiſe when he draws his Breath. The Office of the Surgeon here ſeems to be, to clear the internal Part of the *Thorax* from the extravaſated Blood, and to heal the external Wound, the methods of doing which we have already explained: No application can be made to the internal Wound; that muſt be left to Nature. Whenever the divided Veſſels contract themſelves, and the Blood ſtops of itſelf, the Patient will recover; though Perſons who have recovered from theſe Wounds are remarkably ſubject to Ulcers of the Lungs and Conſumptions. Whenever any of the larger Pulmonary Veſſels are divided, the violence of the Hæmorrhage either brings preſent Death with it, or, if it ceaſes a little, it returns again, and comes to the ſame end by ſlower Paces. To prevent this as much as poſſible, it will be proper to keep the Patient quite ſtill for ſeveral days; he ſhould ſcarce ſpeak, he ſhould take cooling Medicines, and avoid all ſharp things; and, if his ſtrength will permit it, he ſhould loſe Blood ſometimes by the Arm.

Of the puſhing out of the Lungs.

XV. Sometimes the wounded Part of the Lungs puſhes forward, and ſticks pretty firmly in the orifice of the external Wound, as FONTANUS, TULPIUS, and RUYSCH have obſerved in their Writings. In this caſe, if it is forced back again, it will diſcharge a great quantity of Blood into the Cavity of the *Thorax*, therefore it is better to let it remain in the ſituation you ſhall find it: For by this means it will admit of the immediate application of proper Dreſſings, and you may ſafely encourage it to adhere to the Lips of the external Wound; but if a [a] wounded Portion of the Lungs ſhould be puſhed out of the *Thorax* beyond the Limits of the external Wound, you ſhould wrap a fine piece of Linen round this Part, and make a Ligature above the Linen, taking off all that is below the Ligature with the Knife, and returning the ſound Part of the Lungs into the Body, keeping one end of the Ligature conſtantly hanging out at the external Wound. When you have proceeded in this manner, keep the Wound open with a Tent, till the Ligature can ſafely be drawn out. How the external Wounds ſhould be treated we have ſufficiently explained already.

What Internals are to be given.

XVI. As to the Medicines which are to be preſcribed for internal uſe, they conſiſt chiefly, after the Hæmorrhage is over, of vulnerary Decoctions, giving at due diſtances of time a Doſe of *Balſamum* LUCATELLI, *vel* MEIBOMII, obſerving at the ſame time ſtrict regulation with regard to Diet. By following theſe Rules a Surgeon may ſometimes ſave a Patient that has received a Wound of this

[a] HILDANUS, *Cent.* II. *Obſ.* 3. relates a caſe of this kind, where a Portion of the Lungs forced its way through a Wound of the *Thorax*, and part of it appearing black and corrupted, he took it off with a red hot Knife, and then forced the ſound part back again into the Body. The Patient, he tells you, ſurvived this, and recovered a perfect ſtate of Health.

kind, at leaſt where it was impoſſible to perform a Cure, he will have the ſatiſfaction of having done his Duty.

EXPLANATION *of the* SIXTH PLATE.

Fig. 1. A braſs *Tournequet* after PETIT's manner, but with ſome alterations: The uſe of this Inſtrument, and method of applying it, will eaſily appear, if you compare it with what we have ſaid above in *Chap.* II. *Of Wounds*, §. 15. and afterwards in the *Explanation of the fourth Plate*, *Fig.* 2 *and* 6.

Fig. 2. A handle to fix Needles in when you are to make Sutures: This the *French* call *Portaiguille.*

Fig. 3. Another of the ſame ſort from GARENGEOT.

Fig. 4. PETIT's handle for Needles.

Fig. 5. A Needle to perform *Gaſtroraphy.*

Fig. 6. Another of a larger ſize.

Fig. 7. Another, which is new, to perform the ſame Operation.

Fig. 8. A Syringe for various uſes, furniſhed with Pipes of different ſorts; by the help of this you may not only inject Fluids into Wounds of the Abdomen and *Thorax*, into the Fauces, into Abſceſſes, Ulcers, and into the Uterus; but you may alſo by the aſſiſtance of this Inſtrument draw extravaſated Blood from the Cavity of the *Thorax*, in which caſe the Syringe ſhould be twice as large; the mouth of the Pipe A ſhould be triangular, and about two Thumbs breadth.

Fig. 9. Another Pipe with a round Mouth, intended for the ſame uſes.

Fig. 10. A ſmaller Pipe, which may be faſtened to the Syringe, *Fig.* 8. for various uſes.

Fig. 11. Another ſomewhat curved, and perforated on both ſides: This will ſerve to ſuck Blood out of the Cavity of the *Thorax*, and to throw Injections into that Part, or into the Fauces.

Fig. 12. Another perforated at the end like a Cullender.

Fig. 13. Another like the former, but curved, to throw Injections into the Uterus, and for other uſes.

Fig. 14. An Iron Inſtrument like an Ear-picker, for various uſes.

CHAP. XI.

Of WOUNDS *of the Neck.*

Wounds of the Neck of bad conſequence.

I. WOUNDS of the Neck are no leſs dangerous than thoſe of the *Thorax* or Abdomen; inſomuch that I am ſurprized to find ſeveral Chirurgical Writers treat of Wounds of this Claſs ſlightly, as if they were ſcarce worthy of their notice.

How many kinds of Wounds of the Neck.

II. There are ſeveral ſorts of Wounds in the Neck, ſometimes the ſeat of the Wound is only in the common Integuments, and the muſcular Fleſh: This is attended with very little danger; but the moſt dangerous, and indeed generally incurable Wounds, are thoſe of the larger Blood-Veſſels in theſe Parts; ſuch are

thoſe

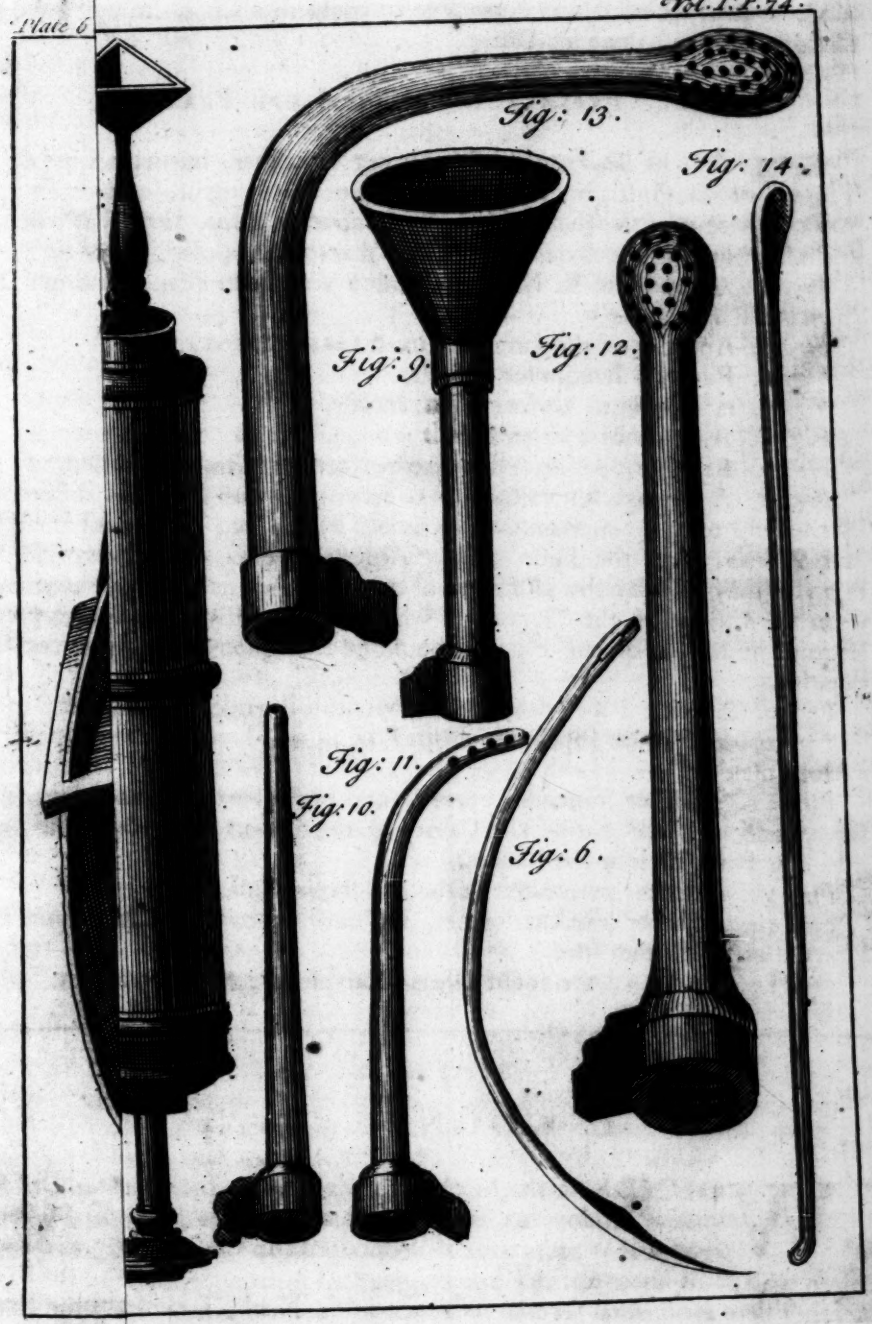
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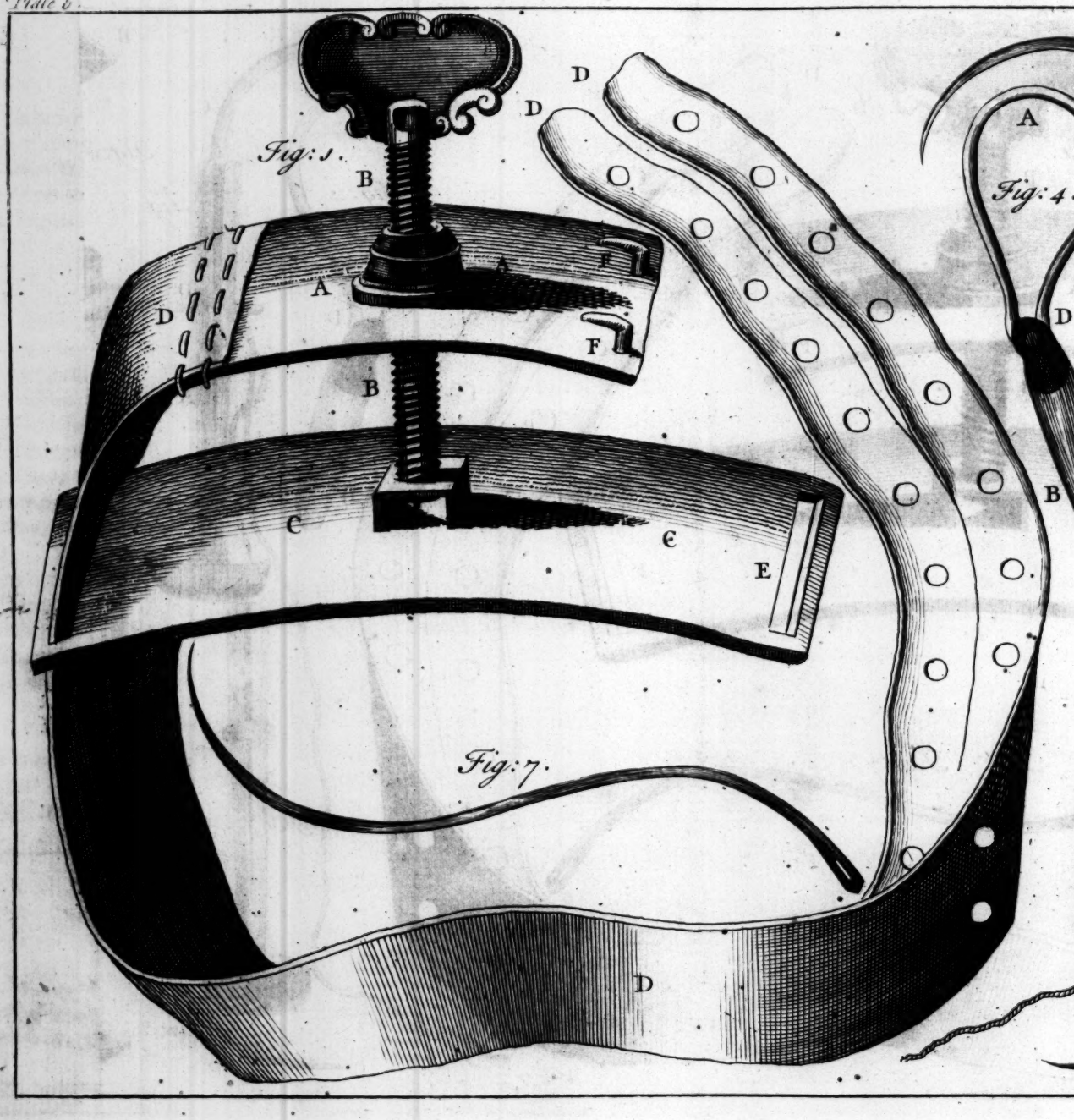
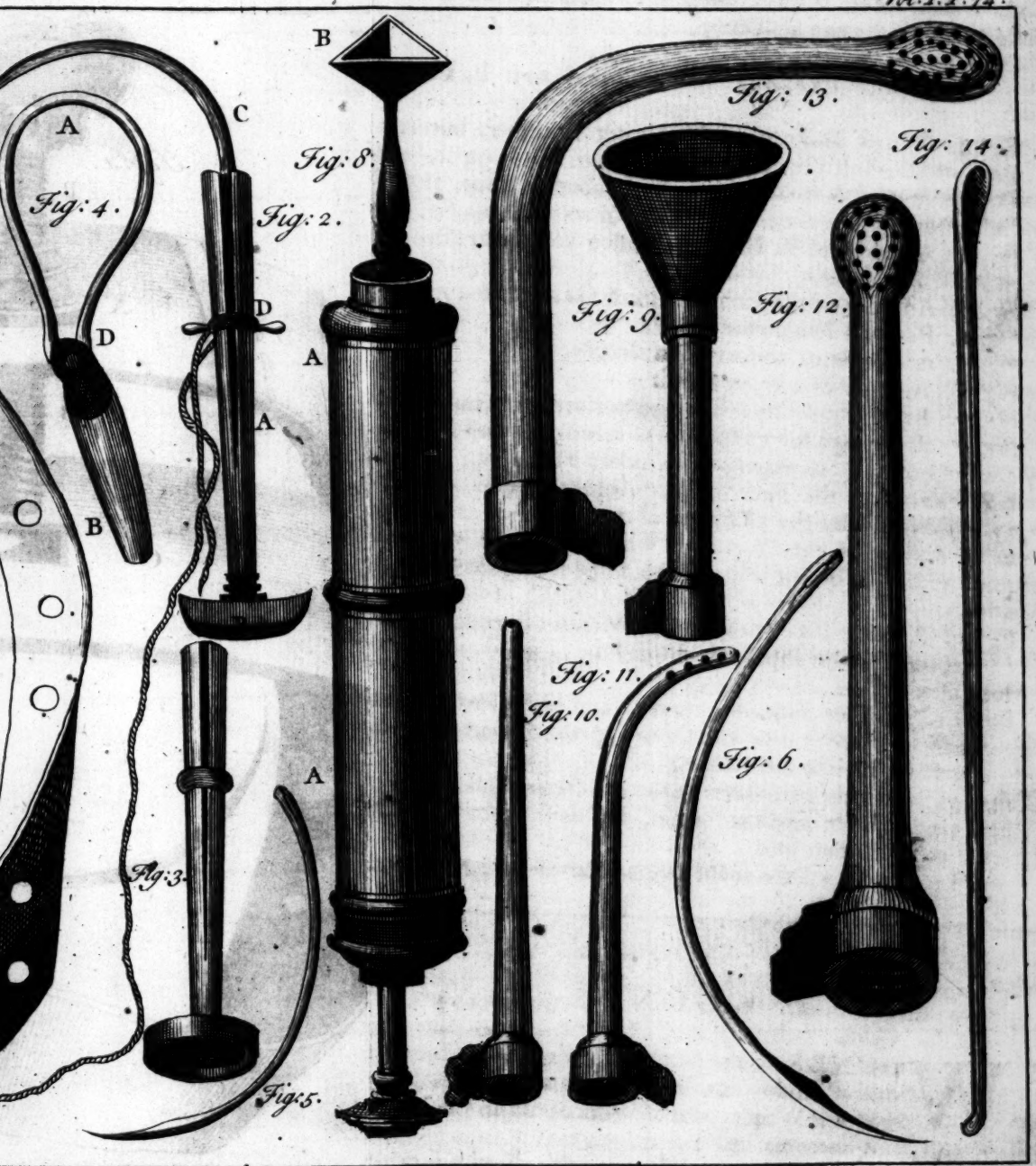
Plate 6.

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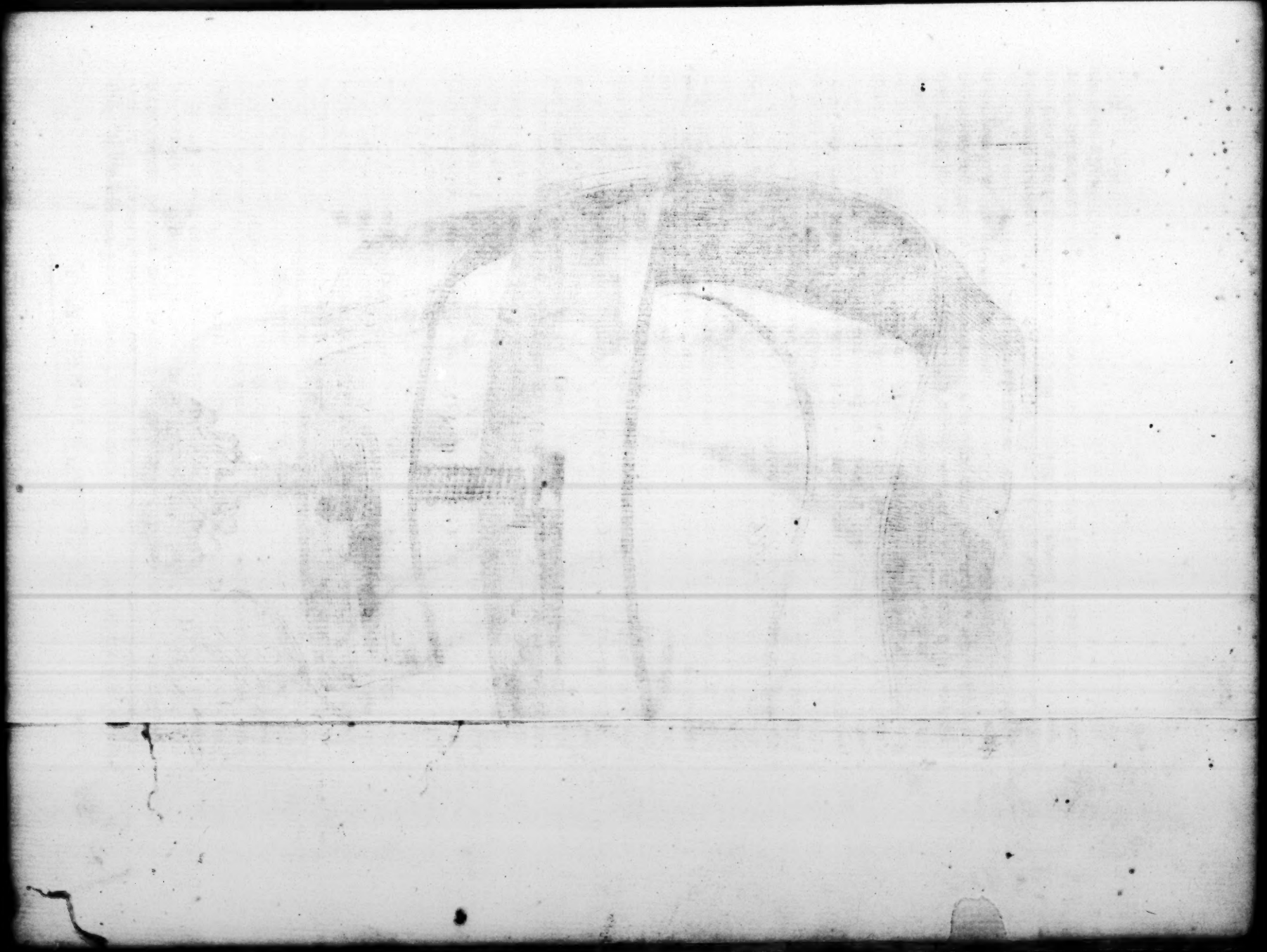

thoſe of the jugular Veins, carotid and vertebral Arteries, or where the Aſpera Arteria is wounded, or the Gula, the Medulla Spinalis, the Nerves that deſcend by the Neck; ſuch as the Par Vagum, the Intercoſtales, and the Diaphragmatici, or where ſeveral of theſe Parts are wounded at the ſame time.

III. You will eaſily diſcover with your Eye, or by conſidering the ſituation of the Wound, and the Symptoms that attend it, what Parts of the Neck are the Subjects of the Wound. After this, the Diagnoſtic and Prognoſtic of thoſe Wounds will eaſily follow; for whoever is thoroughly acquainted with the condition of a Wound, will find no great difficulty in determining the event of it. Where the common Integuments and Muſcles alone are wounded, you will have no reaſon to dread any very ill conſequences; but where any of the other Parts of the Neck are Partakers of the Injury, you have reaſon to apprehend the greateſt Danger, becauſe moſt of thoſe Parts are abſolutely neceſſary to Life itſelf; though in this caſe where the Wound is very ſmall there are ſome hopes of a Cure. Diagnoſtic and Prognoſtic.

IV. Wounds of the Arteries in the Neck are ſcarce ever to be remedied; for in this caſe the Patient uſually bleeds to Death before a Surgeon can be called to his Aſſiſtance; though, to ſay Truth, if a Surgeon were preſent at the inſtant ſuch a Wound was inflicted, all his Art and Induſtry would have little or no effect; for it is extremely difficult to ſtop Blood in this Part, not only from the Largeneſs of the Arteries here ſituated, and from their Vicinity to the Heart; but becauſe it is impoſſible in this place to make a ſufficient Preſſure upon the wounded Veſſel. What happens after Wounds of the Arteries in the Neck.

V. A Wound upon the external Jugular is not attended with much danger, if a Surgeon is called in time; for a ſmall degree of Preſſure is required here, as appears by the frequent Practice of Blood-letting in this Part; but Wounds of the internal Jugulars are extremely dangerous: And this partly from their ſize, which is uſually larger than one of the Fingers; and partly becauſe their ſituation is ſo deep, that no proper application can reach them to any advantage. For theſe reaſons many Surgeons have determined Wounds of this kind to be mortal; but I can by no means admit this as an abſolute Rule without any Exceptions. On the contrary, I am of opinion, that where the Wound in the internal Jugular is ſmall, and a Surgeon is ready at hand, the Patient may be ſaved. How this is to be effected I ſhall teach below. After Wounds of the Veins.

VI. Wounds of the Aſpera Arteria were uſually deemed mortal by Chirurgical [a] Writers: I am ſo far from contradicting them in this Sentence, that I ſhall rather endeavour to ſupport it, that is, where the Wind-pipe is entirely divided, or wounded in its lower Part within the Cavity of the [b] Thorax, or joined with a Wound of the carotid Arteries or internal Jugulars, which is frequently the caſe: But, on the other hand, if it is only wounded in the fore Part, and the neighbouring Veſſels remain unhurt, it is undoubtedly curable; which opinion is ſupported by variety of Examples. Wounds of the Aſpera Arteria.

VII. There are very little hopes of recovery where the Gula is much wounded, or entirely divided; becauſe not only the office of Deglutition is cut off, but the Part is ſo ſituated, that it is almoſt impoſſible to wound it without injuring at the ſame time ſome of the neighbouring Nerves and Blood-Veſſels; but when Wounds of the Oeſophagus.

[a] See BOHNIUS de Vuln. Lethal. Cap. 2. pag. 23.
[b] Ibid. Sect. II. Cap. 3. p. 121.

the Gula is the only ſubject of the Wound, and the Opening is very ſmall, the Wound may ſometimes admit of a Cure.

Wounds in the Medulla Spinalis and Nerves.

VIII. Wounds on any Part of the *Medulla Spinalis* are very dangerous, but more particularly ſo when inflicted upon that part of it which paſſes through the Neck. Therefore it is no wonder that ſcarce any one recovers after a conſiderable Wound of this kind; the reaſon of this will immediately appear, when we conſider that ſeveral Nerves proceed from this Part, which are abſolutely neceſſary to conduct the Œconomy of the animal, that the vertebral Veins and Arteries will almoſt always be wounded at the ſame time, and that the ſituation of theſe Parts is ſuch, that it is impoſſible to convey the proper Remedies to them. Nor are Wounds of the large Nerves of the Neck, ſuch as we mentioned at *N.* 2. leſs dangerous than theſe; for if they are divided, the Parts of the Thorax or Abdomen to which Nature had determined them, will immediately loſe their aſſiſtance, and of conſequence become unequal to the offices for which they were intended.

How ſlight Wounds of the Neck are to be treated.

IX. The treatment of Wounds in the Neck is different according to the different Nature of the Wound. When the common Integuments and muſcular Fleſh are the ſole ſubjects of the Wound, it will require the ſame method of treatment which we have adviſed above for all ſlight Wounds, upon what Part ſoever they may be inflicted. Where the external Jugular is wounded, the ſame methods which we uſe after bleeding in that Vein will be ſufficient.

Cure of a Wound in the internal Jugular.

X. When the internal jugular Vein has received a ſmall Wound, the Hæmorrhage will eaſily be ſtopped by filling the Wound well with dry Lint, or with the Fungus called *Crepitus Lupi*, laying over theſe applications ſquare Bolſters, and ſecuring all with a Bandage, drawn as tight as the ſituation of the Part will admit. An Hæmorrhage is much eaſier ſuppreſſed in a Vein than in an Artery, the whole of the Cure depends upon the degree of Preſſure that you can make upon the wounded Veſſels. Sometimes it happens that the method of dreſſing which we have juſt adviſed in this caſe will have no effect; when this ſhall happen, the Surgeon or his Aſſiſtant muſt keep his Finger conſtantly upon the Wound, or make a Preſſure upon the Part, with ſuch an Inſtrument as we deſcribed in *Plate* IV. *Fig.* 2. till the Hæmorrhage is entirely ſtopped: This Preſſure ſhould uſually be continued for a day or two, the ſame Proceſs ſhould alſo be obſerved in Wounds of the vertebral Veins. After the Blood is ſtopped, the dreſſings ſhould continue upon the Part untouched till the third day, and then a vulnerary Balſam and Plaſter may be applied to heal the Wound.

How a large Wound of the internal Jugular is to be treated.

XI. When the internal Jugular has received a large Wound, or is entirely divided, the Patient will preſently die with the loſs of Blood: But if a Surgeon ſhould be preſent when ſuch a Wound is received, or ſhould come in inſtantly afterwards, I would adviſe him to make a Preſſure upon the divided Vein with his Finger, and to enlarge the Wound upwards and lengthways, till he can come at enough of the Veſſel to make a ſtrong Ligature upon it by the aſſiſtance of a crooked Needle, and then he may fill up the Wound, and treat it as at *N.* 10. By this means the Life of the Patient may be ſaved, though the courſe of the Blood through this Veſſel be entirely cut off. I have often tried this Experiment upon a Dog, and he has recovered, and never ſuffered any apparent Inconvenience from it; therefore I think it is better to put this doubtful remedy in execution, than to leave the caſe as deſperate.

XII. A

How a Wound in the carotid Artery is to be treated.

XII. A Wound in the carotid Artery is attended with greater danger than a Wound in the internal Jugular; but if a Surgeon is preſent when the Wound is received, I think he ſhould make the ſame attempts to cure it; this is more likely to meet with ſucceſs in Wounds of the upper and middle Part of it, than in Wounds of the lower Part: But where the Wound is not in the Trunk of the Artery, but in one of its Branches near the Head, you ſhould fill up the Wound with Lint, dipped in ſome ſtyptic Liquor if you have it ready, then cover it up with thick Compreſſes, ſecuring all with a tight Bandage, and ordering an Aſſiſtant to make a Preſſure upon the Part for ſome time with his Hand. By theſe methods I have very ſucceſsfully ſtopped violent Hæmorrhages, which have proceeded from wounded Branches of the carotid Artery, which I have divided in taking out large ſchirrous, parotid, or ſubmaxillary Glands. In theſe caſes, you ſhould never remove the dreſſings till the third or fourth day.

How to treat Wounds of the Aſpera Arteria.

XIII. In curing Wounds of the *Aſpera Arteria*, the Surgeon ought after cleaning the Wound, to endeavour to unite the divided Parts by the aſſiſtance of ſticking Plaſters, or, where the Wound is large, by making two ſtitches with a crooked Needle, dreſſing them up afterwards with ſome vulnerary Balſam, a ſticking Plaſter, and proper Compreſſes, adviſing the Patient to keep his Head in a prone ſituation. [a] The Wound thus treated will eaſily heal, if it is made either by Puncture, or by a cutting Inſtrument; but if any Part of the *Aſpera Arteria* is carried away by a Bullet, the Suture is to no Purpoſe: Wounds of this kind are more readily healed and filled up by the uſe of a digeſtive Ointment, or vulnerary Balſam. If the *Aſpera Arteria* is entirely divided, and the lower Part of it contracts itſelf into the Cavity of the *Thorax*, ſo that it cannot be laid hold on, and united to the upper Part, the Patient muſt undoubtedly die.

How to treat Wounds of the Oeſophagus.

XIV. Where the Œſophagus is wounded, whatever the Patient attempts to eat or drink paſſes through the Wound, and he is uſually attended with Hiccoughs and Vomiting. Where the Œſophagus is entirely divided, there is no Poſſibility of curing it; but where it is only perforated or wounded in part, you may attempt the Cure by dreſſing the Wound with a vulnerary Balſam, by endeavouring to unite it with ſticking Plaſters, and by adviſing the Patient to a ſtrict Abſtinence for ſome days, or at leaſt to take nouriſhment by the mouth very ſparingly, at the ſame time preſcribing nouriſhing Clyſters of Broths or Milk; but when the neceſſities of Nature require nouriſhment to be taken by the mouth, the Wound ſhould conſtantly be diligently cleaned afterwards, leſt any Part of what was taken ſhould ſtick by the way and putrify, which would bring on very bad Symptoms: After the Wound is cleaned in this manner, it is to be dreſſed up daily till it heals.

How Wounds of the Medulla Spinalis are to be treated.

XV. Wounds of the *Medulla Spinalis* are beſt dreſſed with the *Balſamum Peruvianum*, *Eſſentia Myrrhæ aut Succini*, *Spiritus Maſtiches*, or with Medicines of the like nature, mixed with a ſmall quantity of *Mel Roſaram* ſpread upon Pledgits, and applied moderately warm; the event muſt be left to God's Providence, and the ſtrength of the Patient's Conſtitution. Slight Wounds of

[a] Cures of this kind are to be met with in BARTHOLIN, *in Hiſt. Anatomic. Cent.* V. *Hiſt.* 89. and in TULPIUS, Obſ. Lib. I. Cap. 50. and in other Writers.

theſe

theſe Parts ſometimes heal by this method, but large Wounds here bring certain Death.

How to treat wounded Nerves in the Neck.

XVI. Wounds inflicted upon the large Nerves which are ſituated in the neck are generally mortal, but where the Wound is very ſmall, the ſame methods may be attempted which we adviſed in Wounds of the Medulla Spinalis.

CHAP. XII.

Of WOUNDS *of the Head in general.*

Wounds of the Head very dangerous.

I. NO Wounds are attended with more danger than thoſe which are inflicted upon the Head: For the ſlighteſt Injury of the Brain will frequently bring on the worſt of Symptoms, and even Death itſelf; and Wounds of the Head which do not penetrate into the Cranium, and proceed only from a ſlight Fall or Stroke, even with a blunt Inſtrument, ſometimes occaſion a Rupture of ſome of the internal Blood-Veſſels, and an Extravaſation of Blood in the Brain, which is attended with the moſt miſchievous conſequences; therefore even the ſlighteſt Wounds of the Head require all the care and caution that we are maſters of.

Wounds of the Head are of two kinds.

II. We ought carefully to diſtinguiſh, 1. What Parts of the Head are wounded; and, 2. In what manner the Wound was made: For ſome Wounds of the Head are made with acute Inſtruments, either by ſtabbing or cutting; ſome are made with blunt Inſtruments, which is the caſe in ſome Blows or Falls, and in Gun-ſhot Wounds: Theſe of the laſt Claſs are attended with much greater danger than thoſe of the former.

What Parts are wounded.

III. As to the Parts which are wounded, they are either the common Integuments alone, or with theſe the Fleſh of the Face, or the Pericranium, or the temporal Muſcles, or the Cranium, or ſometimes the internal Parts alſo, ſuch as the Dura Mater, Pia Mater, and the Brain, either in its cortical or medullary Part, or in its Ventricles. When the Cranium is wounded it is either cut, broken or contuſed. It may not be amiſs to divide Wounds of the Head into two Claſſes; 1. Thoſe that affect the Face. 2. Thoſe that hurt or wound the Cranium.

CHAP. XIII.

Of WOUNDS *of the Face.*

Of Wounds of the Face in general.

I. SINCE the Face was intended for Beauty as well as for particular uſes, two things are to be remarked, to wit, that we do not leave worſe Injuries upon the Face than we were employ'd to cure, and that we make an even fair Cicatrix. As the Face conſiſts of various Parts, each of which requires a diſtinct method of Treatment, it will be neceſſary to treat of each of them ſeparately.

Of Wounds of the Forehead.

II. In almoſt all Wounds of the Forehead this is principally to be obſerved, that after the Wound is cleaned from grumous Blood, and any foreign Bodies that

that may have got into it, it ſhould be anointed with ſome vulnerary Balſam, ſuch as the *Balſamum Peruvianum*, *Copaibæ*, or any other of that kind; the lips of the Wound are then to be kept together with narrow ſlips of ſticking Plaſter, and over this a vulnerary Plaſter is to be laid: Where the Wound is large, theſe Plaſters will not be ſufficient to form an even Cicatrix, therefore to forward this end it will be proper to ſprinkle the Wound with *Pulvis Sarcocollæ*, *vel pulvis ex Radice Symphyti*, *Gummi Tragacanth. ac Gummi Arabico præparatus*; you may then apply your Plaſter, Compreſſes, and proper Bandages. The bloody Suture is never to be uſed either in theſe or any other Wounds of the Face, where it can be avoided, for the Stitches encreaſe the number of Scars. If a Wound of the Forehead is made in a ſtrait Line, the *uniting* or *incarning Bandage*, deſcribed in *Plate* II. *Lett. f.* will be of great ſervice in forming a fine Cicatrix; it is to be applied to the Forehead, after the ſame manner which we adviſed it to be applied to the Abdomen, in longitudinal Wounds of that Part, *See Chap.* V. *N.* 10. but if the Forehead is wounded tranſverſely, and the Fibres of the frontal Muſcle are divided, it occaſions a great Deformity: For the power of lifting up the Eye-brows, and of contracting the Skin of the Forehead ceaſes; in this caſe, after cleaning the Wound, it is beſt to unite it with a Stitch or two, dreſſing it with a vulnerary Balſam, and laying on ſticking Plaſters, ſecuring all with a proper Bandage, and adviſing the Patient to keep himſelf ſtill. It ſometimes happens in young healthy Perſons, that the divided Fibres of the Muſcles join and unite without any Suppuration, where this method of dreſſing is diligently followed. If any great degree of Hæmorrhage ſhould enſue upon Wounds of this part, the firſt intention is to ſtop it with dry Lint, Compreſſes, and a tight Bandage; and at the next dreſſing after it has been well cleaned and waſhed with warm Wine, its lips ſhould be brought together as before with ſlips of ſticking Plaſter.

III. Wounds of the Eye-brows require much the ſame treatment with Wounds of the Forehead, only in Wounds of the Eye-brows more particular care muſt be taken to guard againſt Inflammation, leſt the Eyes ſhould partake of the Injury: All ſharp things ſhould be avoided both in eating and drinking, and if the Patient is of a plethoric habit of body he ſhould loſe Blood in the Arm; the uſual dreſſings ſhould be covered with Compreſſes dipped in camphorated Spirit of Wine. If the Wound is large, and the Eye-brows entirely divided, it will be neceſſary to uſe the Suture, and to dreſs them up with a vulnerary Balſam and Plaſter, covering up both Eyes, and keeping them as much as poſſible from motion: By neglecting this method, the ſituation of the Eyes in this caſe will have a very frightful effect. Of Wounds of the Eye-brows.

IV. Wounds of the upper or lower Eye-lid will not readily heal, not ſo much from the thinneſs of the Parts of which they are compoſed, as from the quantity of Fluids with which the Eyes are continually moiſtened. At firſt therefore it will be beſt to foment the Eye *cum Decocto quodam ex Chamomillâ*, *Hyſſopo*, *vel Euphraſiâ confecto*, till the Flux of Blood is ſtopped, and the Wound well cleaned. When the Wound is tranſverſe, you may ſtitch it up in the middle with a fine Needle, ſprinkling it afterwards with the Powder deſcribed at *N.* 2. or anointing it *cum Balſamo Copaibæ*, *de Mechâ*, or with any other of the ſame kind, or with *Oleum Ovorum*, laying over it the *Emplaſtrum Diapalmæ*, and tying it up ſo that the Eyes may have very little power to move. Where the Of Wounds of the Eye-lids.

the Wound is lengthways you muſt make ſeveral ſtitches, and dreſs it up as before.

Of Wounds of the Eyes.

V. If the Eye is wounded, but not ſo as to let out the vitreous or cryſtalline Humour, the following method will be of great ſervice: The Wound ſhould be anointed two or three times in a day with a Feather or fine Rag, well dipped in *Unguentum Alabaſtrinum, aut Albumen Ovi, aut Mucilag. Sem. Cydon. & Pſyllii Aq. Roſar. parat.* and afterwards a ſmall Compreſs is to be laid on, being well ſaturated with the following Collyrium. ℞ *Albumin. Ovor. N.* 2. *Aq. Roſar.* ℥ii ß. *Ol. Roſar.* ʒ ß. *Camphor. Gr.* iii. *probè conquaſſando.* NUCK gives us a Caſe, where a Man was ſo wounded in the Eye that part of the vitreous Humour fell out, nevertheleſs he cured him without leaving any diſorder in his Sight: His method of cure was as follows; he divided the Part of the vitreous Humour that hung out of the Eye from the reſt, and then diligently fomented the Eye with a Collyrium, prepared *ex Albumine, Aquâ Roſarum, Bolo Armenâ & Camphorâ probè conquaſſatis. Gumm. Arabic.* ℈i. *in Aquæ Roſar.* ℥i. *ſolut.* is very ſerviceable in this caſe; but if it is attended with any great degree of Inflammation, which is frequently the caſe, it will be proper to cover the ſmall Compreſs with a larger, dipped *in Spiritu Vini camphorato calido.* The Bowels alſo ſhould be kept looſe for ſome days with opening and cooling Medicines; if there is a plethoric habit, Blood ſhould be drawn from the Neck or Feet, all warm or ſharp things ſhould be thrown out of the Patient's Diet, and great care taken to keep him quiet; by obſerving theſe Regulations, not only the Eye, but the ſight of it alſo may be preſerved: When the cryſtalline Humour, or any part of it ſticks in the Orifice of the Wound, it ſhould be pulled out, that it may not bring on deformity, or worſe miſchief upon the Eye.

Where the Humours are fallen out.

VI. When the vitreous and cryſtalline Humours are fallen out of the Eye, not only the ſight, but figure of the Eye muſt be entirely deſtroyed: Therefore at firſt it ſhould be dreſſed with Compreſſes dipped in warm Wine, or Spirit of Wine, and afterwards with ſome vulnerary Balſam. The deformity which the loſs of ſubſtance in the Eye will occaſion, may be avoided by the help of an artificial Glaſs or Silver Eye, *See Plate* VII. *Fig.* 1. but we ſhall treat more largely of this [a] in another place.

Sight ſometimes reſtored.

VII. It ſometimes happens when only the *Tunica Albuginea* and *Sclerotica* are ſlightly wounded, the *Cornea* and *Uvea* remaining unhurt, that the Eye recovers itſelf, and though both the vitreous and cryſtalline Humours fall out by the Wound [b], yet they are renewed again by the benefit of Nature, and the office of ſight performed as well as before the Injury happened. Dr. SEEGER ſome time ſince was ſo kind as to communicate the hiſtory of a Caſe of this ſort to me, whence it appeared that he had reſtored Sight to a Woman after ſhe had loſt the Humours of her Eye. When we have duly conſidered this, we ſhall not altogether reject the Teſtimonies of BURRHUS and KERKRINGIUS, when they affirm to us that they have acquired the art of reſtoring the Sight after the Humours are entirely fallen out of the Eye. We may now alſo credit thoſe who [c] affirm that the Sight may be enjoyed without the aſſiſtance of the

[a] Tract. de Duct. Oculor. Aquoſ. Pag. 126, 127—132. [b] CREDAT JUDÆUS.

[c] You may find many Inſtances related of Perſons who have enjoyed their Sight after the loſs of the cryſtalline Humour, in SKENKII *Obſ. Med.* HILDANI *Obſ.* 26. *Cent.* I. ACT. MED. HAFN. *vol.* I. *Obſ.* 69.

cryſtalline

cryſtalline Humour, notwithſtanding[a] ſome have ſtrenouſly maintained the contrary.

VIII. Wounds of the Noſe are generally cured by the dry Suture; but where the Wound divides the Cartilage, and penetrates ſo deep that the Lips of it cannot be kept in contact by the Application of ſticking Plaſters, the true Suture muſt be made through the Skin on each ſide of the Wound. Though it ſounds very unlike Truth that any Part of the Noſe ſhould be entirely ſeparated from the reſt, and afterwards united to it again by the Aſſiſtance of Sutures; yet BLEGNY affirms that this has happened. *See Zodiac. Med. Gall. Edit.* 1680. *pag.* 75. When the naſal Bones are fractured, it is uſual to place ſmall Tubes made of Lead or Silver under them for ſome time, leſt the Paſſage of the Noſe ſhould be ſtopped by the ſhooting out of the new Fleſh: You will ſee theſe Tubes deſcribed at *Plate* II. P. Q. R. Externally you may uſe ſome Balſam, or *Eſſentiâ Maſtiches, Succini, vel Myrrhæ*, or ſome glutinous Powder, ſuch as you have ſeen directed at *N.* 2. The lips of the Wound ſhould be kept in contact with each other by the help of ſticking Plaſters, and of a four-headed Bandage; the Application of which will be explained when we come to treat profeſſedly on Bandages. Wounds of the Noſe.

IX. Wounds of the Lips are made either with ſharp or blunt Inſtruments, or with Bullets: Wounds of the firſt ſort, whether they are made lengthways, or tranſverſe, are generally to be cured by the dry Suture; the Patient in this Caſe muſt diligently avoid both chewing and talking, his Diet therefore muſt be entirely Spoon-meat; if the Wound is very large, it will require the bloody or true Suture. In Wounds of theſe Parts which are made by blunt Inſtruments, by Falls, or by Bullets, the ſhattered Parts ſhould be brought to digeſtion, and the lips of the Wound, after being cleaned, are brought together, either with ſticking Plaſters, or by the Suture which is uſed for the Hare-lip; which we ſhall deſcribe below. Wounds of the Lips.

X. Wounds of the Cheeks ſhould be treated after the ſame manner, and with the ſame circumſpection which we adviſed for Wounds of the Lips: But if one of STENO's *Salivary Ducts* is wounded in its Paſſage croſs the Cheek from the *parotid* Gland, the conſtant diſcharge of Saliva into the Wound will prevent the Cure, till the Duct is perforated in the internal part of the Cheek, to make a Paſſage for the Saliva into the Mouth. This method of Cure is propoſed by CHESELDEN in his *Anatomy*. Wounds of the Cheeks.

XI. Wounds of the external Ear are eaſily united by ſticking Plaſters, unleſs the Cartilage is entirely divided; and then it will require the help of the Needle, and the application of vulnerary Balſams, with proper Compreſſes and Bandages: When the Ear is wounded in the neighbourhood of the *Meatus Auditorius*, Care muſt be taken to prevent the Diſcharge of Blood and Matter into that Paſſage, which would do great Miſchief to the *Tympanum*; this may be done by filling the internal Ear with Lint or Cotton. Wounds of the Ear.

XII. The Tongue is ſo well guarded by Jaw-bones and the Teeth, that it is very rarely the ſubject of a Cut or Stab; but it is frequently bit in Fits of the Epilepſy, in violent Falls, and it is ſometimes wounded by a Bullet. If the Wound of the Tongue is not very large, it will eaſily heal by the Wounds of the Tongue.

[a] See my Treatiſes on the *Cataract, Glaucoma, &c.*

application of *Ol. Amygdal. dulc. cum Sacch. Cand. q. s. admiſt. aut Mel Roſar. cum Ol. Myrrhæ per Deliquium.*

How to cure large Wounds of the Tongue.

XIII. Large Wounds of the Tongue will not unite without the aſſiſtance of the Suture. It is no wonder therefore that Wounds near the root of the Tongue always leave a Fiſſure in the Part, ſince their ſituation prohibits the uſe of the Needle: To prevent loſs of Speech enſuing upon large Wounds of the fore part of the Tongue, the divided Parts ſhould be brought together with the Needle, as ſoon and as neatly as poſſible, and afterwards anointed with the Medicines which we preſcribed in the laſt Article, ſince ſticking Plaſters will not take place here. PURMAN affirms that he made uſe of Silver Threads in Sutures upon this Part to great advantage. *See his Surgery, P.* I. *Chap.* 6. Gun-ſhot Wounds upon the Tongue are to be dreſſed with the Medicines which we recommended above at *N.* 12. for Sutures are of no ſervice in this caſe: The Patient ſhould keep from ſpeaking, and live upon Spoon-meats during the Cure; but more particularly when the Wound is juſt beginning to unite.

Wounds of the Palate.

XIV. Wounds of the Palate will heal beſt if you anoint them with *Mel Roſarum* alone, or with the addition of a ſmall quantity of *Balſamum Peruvianum*, or ſometimes *Oleum Myrrhæ per Deliquium.* Theſe Remedies alſo have great efficacy in curing all other Wounds of the Mouth.

CHAP. XIV.

Of the principal WOUNDS *of the Head.*

Intent of this Chapter.

I. WE obſerved above, that Wounds of the *Cranium* were to be reckoned under the ſecond Claſs of Wounds in the Head: Theſe, by way of Eminence, are alone called *Wounds of the Head*; they are divided into ſeveral Diſtinctions, according to the different Parts that are the Subjects of the Wound. Theſe we ſhall treat of in the order we enumerated them in *Chap.* XII. *at N.* 3. we ſhall begin with the ſlighteſt, which are thoſe Wounds that are inflicted upon the external coverings of the *Cranium.*

Wounds of the external Parts.

II. There are ſeveral ways of diſcovering that the Wound is terminated in the external Parts of the *Cranium*; 1. By the Eye. 2. By the Probe, which ſhould be uſed very gently here, for fear of bringing on farther Miſchief. 3. By examining the Inſtrument with which the Blow was given, and by conſidering the degree of Force with which it was impelled. And, 4. Laſtly, by the Abſence of violent Symptoms; for a violent Blow upon the Head will always be attended with Vomitings, Vertigo; Blood will be diſcharged by the Noſe, Ears and Mouth, and the wounded Perſon will loſe his Speech and Senſes. Theſe Diſorders will appear ſometimes ſooner, ſometimes later; but always more violent when the Wound is made by a Fall, or by ſome blunt Inſtrument, in which caſe the *Cranium* is uſually much ſhattered. The Blood which diſcharges itſelf by the Wound, when it is made with a ſharp Inſtrument, will inſinuate itſelf between the common Integuments and the *Cranium:* In Contuſions that are made with blunt Inſtruments, ſometimes it will lie concealed under the *Cranium*, and by corrupting the *Perioſteum* and *Cranium* will bring on

Ulcers and Caries of the Bone; frequently it will occaſion Fever, Convulſions and Death.

III. When the temporal Muſcles are wounded at the ſame time, the Patient will be attended with grievous Diſorders, but more eſpecially when this happens by a Blow or a Fall, or by a Bullet; not only becauſe theſe Muſcles are neceſſary for the offices of dividing the Food, and for forming the Speech, but becauſe they are furniſhed with conſiderable Nerves, Tendons and Arteries, which will partake of the Injury; and laſtly, becauſe the *Cranium* is thinneſt in this part. Wounds of the temporal Muſcles.

IV. Wounds that are made on the external Parts of the Head by acute Inſtruments, and not attended with any violent Symptoms, are eaſily cured by the ſame methods which we have before preſcribed for other Wounds; only, in order to make the proper applications, it will be neceſſary in the firſt place to ſhave the Part with a Razor. There will be no occaſion ever to make Sutures upon theſe Parts, ſince ſticking Plaſters will always anſwer your end. You ſhould always endeavour to be as expeditious as poſſible in finiſhing each dreſſing, the Medicines are to be applied warm, and the Air kept in a moderate heat with hot Coals: If there ſhould be any great degree of Hæmorrhage, which will frequently happen from the number of Veſſels that are liable to be wounded in this Part, it muſt be ſtopped with dry Lint, or where that is unequal to the taſk, *cum Alcohol Vini, vel Lupi Crepitu, vel Pulvere quodam aſtringente:* Theſe applications ſhould be ſecured with a tight Bandage. After the Hæmorrhage is ſtopped, you may dreſs with *Mel Roſarum*, or ſome digeſtive Medicines, till the Wound is well deterged; and then with a vulnerary Balſam, or dry Lint, till it is healed. Cure of Wounds on the external Parts of the Head.

V. It has been frequently the Practice amongſt Phyſicians, to order [a] medicated Bags to be applied to the Head, when it has been conſiderably wounded, to prevent or aſſwage the violence of the Symptoms, ſuch as Tumors, Inflammations and Pain; theſe Bags are ſtuffed *cum Betonicâ, Salviâ, Majoranâ, Serpyllo, Origano, Roriſmarino, Floribus Lavendulæ, Salviæ, Roſarum, & ſimilibus*; theſe they boil in Wine, and, after having gently preſſed them, they apply them as warm as the Patient can bear them to the wounded Part; where the Symptoms are already urgent, they make two Bags, and apply them alternately: By theſe means the inſpiſſated ſtagnating Blood is rendered fluid, and the miſchief is frequently removed without having recourſe to the Trepan. When the Symptoms are too violent to be removed by theſe applications, we are forced to uſe other methods according to the nature of the Diſorder. Of theſe we ſhall treat in the ſubſequent Articles. The Uſe of medicated Bags.

VI. In violent Contuſions of the Head, which will be diſcovered by the Tumor and Softneſs of the Part, by the Separation of the Integuments from the *Cranium*, and by the collection of ſtagnating Blood, which appears to be confined under the Skin; you ſhould endeavour to divide the confined Fluids by attenuating Medicines externally applied, or to diſcharge them by making an Opening with the Knife; or laſtly, to bring them to Suppuration. Where the Extravaſation of Fluids is very conſiderable, it is beſt to diſcharge the greateſt part of them inſtantly by Inciſions, and what remains will be eaſily diſperſed; How Contuſions are to be treated.

[a] This Form is entirely laid aſide with us in ENGLAND, and Fomentations made of the ſame Herbs ſubſtituted.

the application of the medicated Bags deſcribed above will anſwer the Intention of thinning and dividing the ſtagnating Blood; but you may add to the Ingredients which we mentioned *Herba Chamædrys*, *Scordium*, *Sabina*, *Abrotonum*, *Abſinthium*, *Mentha*, *Ruta*, *Flor. Chamomill. Sambuc. Rad. Bryoniæ*, and things of the like Intention. The Bags that are ſtuffed with theſe Ingredients may be quilted, that they may be divided into equal Parcels, and not run together in Lumps; where Wine cannot be had to boil them in, you may make uſe of Water, adding a Proportion of Spirits of Wine, or Malt or Moloſſes, after it has done boiling, and a few ounces of Soap. We ſhall treat more largely upon what is farther to be done in this caſe, in a following Chapter upon *Contuſions*.

How to bring the Parts to Suppuration.

VII. Where you find it impracticable to attempt the Attenuation and Diviſion of the ſtagnating Fluids, it will be proper to attempt the Suppuration of them. In violent Contuſions it will be adviſeable to preſcribe the application of ſuch Cataplaſms as we directed above at *Chap.* II. *N.* 13. and below at *Chap.* XV. but in ſlighter caſes, where there is a ſmall opening, the *Unguentum digeſtivum cum Aloë & Spiritu Vini pauxillo admiſtum* will do the buſineſs, covering the Part afterwards with a warm Plaſter, ſuch as the *Emplaſtrum de Meliloto*, *Malacticum*, *Diachylon ſimplex vel compoſitum*, *vel Empl. de Galbano*. After the Suppuration is formed, and the Matter diſcharged, the Wound will eaſily heal by the application of a vulnerary Balſam; but in violent Contuſions, where there is no opening, or a very ſmall one, by which the Matter cannot be diſcharged, you muſt enlarge the Wound with your Knife, to prevent the neighbouring Parts from being corroded: By this means the Wound will eaſily be cleaned, and, by obſerving the Directions we have frequently laid down above, the Cure will be ſpeedily performed.

Of Wounds of the *Pericranium*.

VIII. When the *Pericranium* is wounded, but not in ſo great a degree as to lay the *Cranium* bare, treat the Wound in the manner we deſcribed above at *N.* 4. *of this Chapter*, omitting the uſe of the vulnerary Oils there preſcribed; becauſe they would injure the *Cranium*, and ſubſtituting in their room ſome warm balſamic Medicines, ſuch as the *Balſamum Peruvianum*, *Eſſentia Myrrhæ*, *Succini*, *Spir. Maſtiches*, and others of that kind: But where the *Cranium* is left bare and expoſed to the Air, its external Lamella being robbed of its nouriſhment, by the deſtruction of the Veſſels by which it was conſtantly ſupplied, will loſe its natural colour, and become yellow, livid, black, and by degrees ſeparate from the neighbouring Parts, and exfoliate, as we term it; which will greatly protract the Cure of the Wound.

Method of treating the *Pericranium* and *Cranium*.

IX. In order to haſten the Exfoliation of the *Cranium*, and forward the Cure, the Surgeon ought to bore ſeveral Holes through the denudated Part, as deep as the *Diploë*, with an Awl, or with Inſtruments like thoſe deſcribed at *Plate* VII. *Fig.* 2. *and Fig.* 7. *Letter* A. This Operation does not only forward the Exfoliation of the Part, but make way alſo for the ſprouting up of freſh Veſſels: The Dreſſing, which ought to be performed each time with expedition, and not repeated ſo often as in other caſes, is to be applied in the following manner: When the Wound is properly cleaned, Pledgits well ſaturated with *Eſſentia Maſtiches*, *Succini*, or any other mild balſamic Medicine, with the addition of a ſmall quantity of *Mel Roſarum*, are to be laid upon the injured Part of the *Cranium*: Over theſe you may clap the *Emplaſtrum de Betonicâ*, and over that the Bolſters and Bandage for the Head, deſcribed

deſcribed above at *Plate* III. *Fig.* 1. A. Theſe applications ſhould be continued till the *Cranium* appears to be found, and the Wound is in a condition to heal. When the *Pericranium* is contuſed, but not ſeparated from the *Cranium*, you muſt endeavour to diſperſe the ſtagnating Fluids, by the application of the medicated Bags deſcribed at *N.* 5, 6. if theſe have not the deſired effect, you may have recourſe to Scarification, and warm Fomentations.

X. There are ſeveral ways by which the *Cranium* may be hurt, by Falls, Blows, Cuts, *&c.* which has occaſioned Authors to divide Injuries of this Part into ſeveral diſtinctions; to wit, into Contuſions, Depreſſions, Fractures, Fiſſures, and [a] Contra-Fiſſures, that is, where the Fiſſure happens on the ſide oppoſite to that which received the Blow. Of Injuries of the *Cranium.*

XI. There are ſeveral Circumſtances concerned in diſcovering an Injury of the *Cranium*; in the firſt Place, you muſt diligently inſpect the wounded Part, and make enquiry with what force the Blow was given that occaſioned it; after this you may ſearch the Wound with a Probe, but very circumſpectly, leſt by puſhing it raſhly forward you ſhould injure the Brain: Some uſe a Pen in the room of a Probe, when they are ſearching for Fiſſures of the *Cranium*, and if the Pen is pointed at the end like a Tooth-pick, it will eaſily detect any Inequality or Roughneſs of the Bone; but you muſt be very careful not to ſuffer yourſelf to be deceived by the Sutures. When Fiſſures of the *Cranium* are ſo very fine, that they eſcape the Eye, and the touch of the Probe, though the violence of the Symptoms ſufficiently declare that the Patient has received an Injury of this kind, it will be neceſſary to lay the Bone bare, and to drop Ink upon the Part of it which you ſuſpect, and wipe it off again immediately with Lint; and if any Part of it is fiſſured, you will find a black ſtroke remain, notwithſtanding your endeavour to wipe the Bone clean. If you are ſtill at a loſs, put a Key into your Patient's Mouth, and bid him bite hard upon it; if this occaſions a Stridor of the Teeth, and Pain, Surgeons are apt to determine that there is a Fiſſure in the *Cranium:* Where the Bone has loſt its natural Colour, they will not allow it to be whole. The moſt certain Signs of a fractured *Cranium* are the violent Symptoms that immediately ſucceed the Injury; ſuch as vehement Pains, Vomitings, Vertigo, and Noiſe in the Ears; if Blood at the ſame time is diſcharged from the Noſe or Ears, the Senſes and Reaſon entirely loſt, and the Patient is continually ſleeping, the matter is out of all doubt. In a few days after the Wound is received you will have a ſmall diſcharge of thin fœtid Matter, about the ſeventh day the Integuments ſeparate from the Bone, and the *Cranium* itſelf is ſometimes ſo very foul, that it lets the Matter through to the Membranes of the Brain, which preſently partake of the Diſorder, and occaſion acute Pains, Spaſms, Drowſineſs, loſs of Motion, or rigor of the Limbs, loſs of Speech, Apoplexy, and at length Death. All theſe Miſchiefs may ariſe from a very ſmall Fiſſure of the Skull: Examples of which you will find very frequent amongſt the Writers in Surgery. Diagnoſtic Signs.

XII. This ought to teach us to be very cautious in delivering our opinions concerning the event of Wounds in the Head; for we can never promiſe a Prognoſtics

[a] Many Writers have denied this caſe to be poſſible; but not only *Hippocrates* in his Book *de Vuln. Capit.* but *Celſus, Lib.* 8. *C.* 4. and *Æginetus, Lib.* 6. *C.* 90. have plainly deſcribed this Caſe; but amongſt the Moderns Dr. *Wagner,* in a Treatiſe *de Contra-fiſſurâ,* and *Le Maire, de Reſonitu,* have put this matter out of all doubt.

Cure,

Cure, though the Wound at firſt ſhould appear to be very ſlight. I ſhall here lay down ſome Obſervations, which are well worthy of a Surgeon's attention; it is very difficult to cure a Man who is poxed, or labours under a ſcorbutical habit of body, at the time he receives a Fiſſure in the *Cranium*. When the temporal Bone is the ſubject of the Injury, the Cure is very doubtful: There remain very little hopes of recovery where the *Cranium* appears black: They alſo are in extreme danger who have a black dry Tongue, full of Clefts, and beſet with Puſtules, or are attended with a Diarrhœa or Dyſentery, or where the Water is either quite clear and white, or as turbid as the Urine of Cattle.

How Injuries of the *Cranium* are to be treated.

XIII. The firſt Queſtion to be aſked when you come to examine a Wound of the Head, is, whether it was made with a ſharp or a blunt Inſtrument: If the Wound was made with a ſharp Inſtrument, and penetrates into the *Cranium*, it muſt be filled at the firſt dreſſing with dry Lint, in order to ſtop the Blood; but in the following dreſſings, after the Matter is well wiped away, you may apply the *Eſſentia Succini*, *Maſtiches*, *Myrrhæve*, *cum admixto Roſarum Melle*. Theſe Dreſſings are to be repeated as long as the condition of the Wound ſhall require it. *See above*, *N.* 4. Where the *Cranium* is very much ſhattered by the Blow, and the Brain wounded, this caſe is attended with very great danger, but requires the ſame method of Treatment with the former; only greater diligence muſt be obſerved in cleaning this Wound, and more expedition in applying the dreſſings, to keep it from the Injuries of the Air.

Wounds of the Head with a blunt Inſtrument.

XIV. When a blunt Inſtrument is the occaſion of an Injury upon the *Cranium*, if the injured Part does not ſufficiently appear of itſelf, we ought to uſe great Induſtry to diſcover it.

How the Wound is to be examined.

XV. You will eaſily diſcover the injured Part, if you divide the common Integuments to the Bone, where they appear tumid and ſoft: In making your Inciſion you ſhould take great care not to lay too much ſtreſs upon your Knife, leſt you ſhould force Splinters of the fractured *Cranium* into the Subſtance of the Brain.

How the Inciſion is to be made.

XVI. If you find it neceſſary to make an Inciſion through the Integuments, the beſt way to make it is in the Form of the Letter X, about an inch and an half in length, lifting up the Skin at each Angle, and leaving the Bone bare; the Blood which is ſpilt may be taken up with a Sponge, and dry Lint ſtuffed between the Skin and the *Cranium*: Having found out the injured Part of the *Cranium*, you may now apply the *Trepan* if you ſhall think it neceſſary. Some Surgeons in ſcalping prefer the figure of the *Roman* Letter V, or the *Greek* Λ; others prefer a longitudinal Inciſion: In Wounds which are made near the Temples, great care muſt be taken not to divide the muſcular Fibres. There are Surgeons who contend much for an Inciſion in the form of a T; but the ſituation of the Wound will always determine you with regard to the figure of the Inciſion which you ſhall make, either for the diſcovery of a Fiſſure, or to prevent or remove bad Symptoms.

What is to be done after Scalping.

XVII. Having diſcovered the injured Part of the *Cranium*, and cleared away the grumous Blood and Matter with a Sponge, you are next to remove any Splinters of Bone that may come in your way, with your Fingers or the Forceps; where they hang to the *Pericranium* you muſt uſe the Sciſſors, where they adhere pretty firmly to the neighbouring Parts of the *Cranium*, it is more adviſeable to replace them, than to endeavour to remove them by violence.

XVIII. When

XVIII. When you have diſcovered by the alteration of the colour of the Bone, what Part of the *Cranium* has received a Contuſion, (*See N.* 8.) you muſt bore ſeveral ſmall Holes through the external Lamella of the Bone, till you find Blood proceed from the wounded *Diploë*; after this you may dreſs the Part up with balſamic Medicines, (*N.* 9.) If upon repeating the dreſſings you diſcover freſh, yellow, or black Spots, the Parts ſo diſcoloured are to undergo the ſame Operation; this is the eaſieſt and moſt expeditious way of remedying this Diſorder. How a Contuſion is to be treated.

XIX. When you diſcover a Fiſſure in the *Cranium*, attended with no other bad Symptoms but white, yellow, or brown Spots upon the face of the Bone, you will find it ſufficient to bore down to the *Diploë*, and dreſs with balſamic Medicines; but where any violent Symptoms come on, which demonſtrate an Extravaſation of Blood in the Cavity of the *Cranium*, the *Trepan* is to be called for without delay. How Fiſſures are to be treated.

XX. The Surgeons amongſt the Ancients uſed another method for the cure of Fiſſures of the *Cranium*, that were not attended with very bad Symptoms; their method was to ſcrape away the upper Table of the Bone, till they came down to the *Diploë*; for this purpoſe they uſed *Rugines*, or *raſping Chiſſels*, of different ſhapes, ſemi-circular, plain, or acuminated, as you may ſee in *Plate* VII. *Fig.* 3, 4, 5. This Practice is ſtill continued by ſome; but the method of boring is far leſs troubleſome, and therefore juſtly preferred to it. The Method uſed by the Ancients in this Caſe.

Of Depreſſion of the CRANIUM.

XXI. The Skulls of Infants and Children are ſometimes depreſſed or dented in by a Blow, without any manifeſt Fracture, or at leaſt it is fractured in ſuch a manner, that from its flexibility it does not ſtart out, but ſtill adheres firmly to the neighbouring Bones; but in Adults this caſe cannot happen, for the Bones in them are become ſo rigid, that it is impoſſible to beat in any Part of the *Cranium* without breaking the Bone to pieces. Theſe Injuries of the *Cranium* are called by the Surgeons *Fractures*: The Brain is frequently injured by theſe accidents, and the actions of it diſturbed. Of Depreſſion of the *Cranium*.

XXII. Theſe accidents are attended with full as bad conſequences as thoſe we have already deſcribed; according to the degree of Depreſſion, ſo is it attended with more or leſs danger, ſometimes it is quite incurable; for in this caſe the veſſels of the Brain are very liable to be injured, which frequently produces ſuch an Extravaſation of Blood in thoſe Parts, as muſt neceſſarily bring on grievous Diſorders, and frequently Death itſelf. Diſorders occaſioned by it.

XXIII. You may eaſily diſcover a *Fracture*, or *Depreſſion of the* CRANIUM; 1. By your Eye. 2. By the Touch. 3. By conſidering the cauſe of the Injury. 4. By the Symptoms that ſucceed it. Depreſſions and Fractures of the *Cranium* are by no means ſo difficult to diſcover as Fiſſures. That Fractures of the Skull are attended with great danger, and frequently with Death, nobody will deny, who conſiders well the ſtructure of the neighbouring Parts. A Fracture in the *Cranium* is eaſily diſcovered.

XXIV. The firſt thing to be done towards relieving this Diſorder, is to lift up any Part of the Bone that is depreſſed, or beat in upon the Brain, or to remove any other body by which that Part is compreſſed: Sometimes a Splinter which is quite ſeparated from the reſt of the Bone, is driven into the cavity of How it is to be treated.

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the *Cranium*, and lies conſtantly vellicating the Brain and its Membranes with its pointed Parts; this is to be removed without Delay.

How ſlight Depreſſions in Infants are to be treated.

XXV. When ſlight Depreſſions are made in the Skulls of Infants, without bringing on any bad Symptoms, you muſt not uſe the forcible methods of raiſing the depreſſed Part, which we directed above, but call thoſe Medicines into uſe which we adviſed for the Cure of Contuſions, ſuch as the medicated Bags boiled in Wine, or Spirit of Wine camphorated; or laſtly, apply a Plaſter to the Part, ſuch as the *Emplaſtrum de Meliloto, ſive de Betonicâ.* Theſe applications frequently cure ſlight Impreſſions, and prevent the miſchievous Conſequences which might be expected from them.

How a larger Depreſſion is to be treated.

XXVI. But where a greater degree of Depreſſion happens to Infants, the Elevation or Reſtitution of the Parts is performed in the following manner: After ſhaving the injured Part, they apply a Plaſter made of very ſticky and gummy Materials ſpread upon a ſtrong piece of Leather, to the middle of which a Cord is faſtened; this Plaſter is laid on pretty warm, and left in its Situation till it is grown cold; the Surgeon then taking hold of the Cord that is faſtened to it, pulls the Plaſter directly upwards, and with it the depreſſed Part of the *Cranium*. *See Plate* VIII. *Fig.* 6. If this does not ſucceed at the firſt trial, it is to be repeated. The application of the Cupping-glaſs to the depreſſed Part will ſometimes ſucceed, eſpecially if you ſtop the Patient's Breath at the Noſe and Mouth during the Operation; but if neither the Plaſter nor Cupping prove of any ſervice, it will be neceſſary to call for the aſſiſtance of an Inſtrument, ſuch an one as you ſee deſcribed at *Plate* VII. *Fig.* 7. *Lett.* B, which is to be applied after the common Integuments and Perioſteum are removed.

How a fractured *Cranium* is to be treated.

XXVII. But when the *Cranium* is ſo depreſſed, whether in Adults or Infants, as to ſuffer a Fracture, or Diviſion of its Parts, it muſt inſtantly be relieved: Some are very high in their Commendations of a ſternutatory Powder for this Purpoſe, aſſerting that the Diſtenſion of the Brain is ſo violent in the act of ſneezing, that it will reſtore the depreſſed Parts of the Bone to their former ſituation; but the ill Conſequences that may attend this Practice are ſo grievous, that in my opinion it ought to be rejected. You will find the Elevatories deſcribed at *Plate* VII. *Fig.* 7. *Lett.* C. and at *Fig.* 8. very ſerviceable, if there is a ſmall Foramen to which the Inſtrument can be faſtened; but if there is no Hole already in the Part, you muſt apply the ſcrew-end of the Inſtrument at *Fig.* 7. *Lett.* B, or one of that kind, by which Application the depreſſed Part may be reſtored. In the mean time an Inciſion ought always to be made through the common Integuments, that they may be drawn back for the Inſtrument to take place, *N.* 15. and a Foramen ſhould be made with a ſharp-pointed Inſtrument, (*Fig.* 7. *or* 2. *Lett.* A.) to admit of the end of the Trepan.

A particular kind of Elevatory with three Feet.

XXVIII. But as the Elevatories at *Fig.* 7, *and* 8. are ſo contrived, that where the neighbouring Bones are depreſſed or fractured, theſe Inſtruments cannot be applied without danger of encreaſing the Complaint, it appeared neceſſary to the Surgeons amongſt the Ancients to invent another Inſtrument for this purpoſe, which might be applied with more Safety; this they called, from the number of its Feet, *Tripes*, *Tab.* VII. *Fig.* 12. it is near twice as big as the Figure we have given you; the Feet AAA may be placed at farther diſtances, or brought nearer to each other, as you ſhall ſee occaſion; the manner of applying

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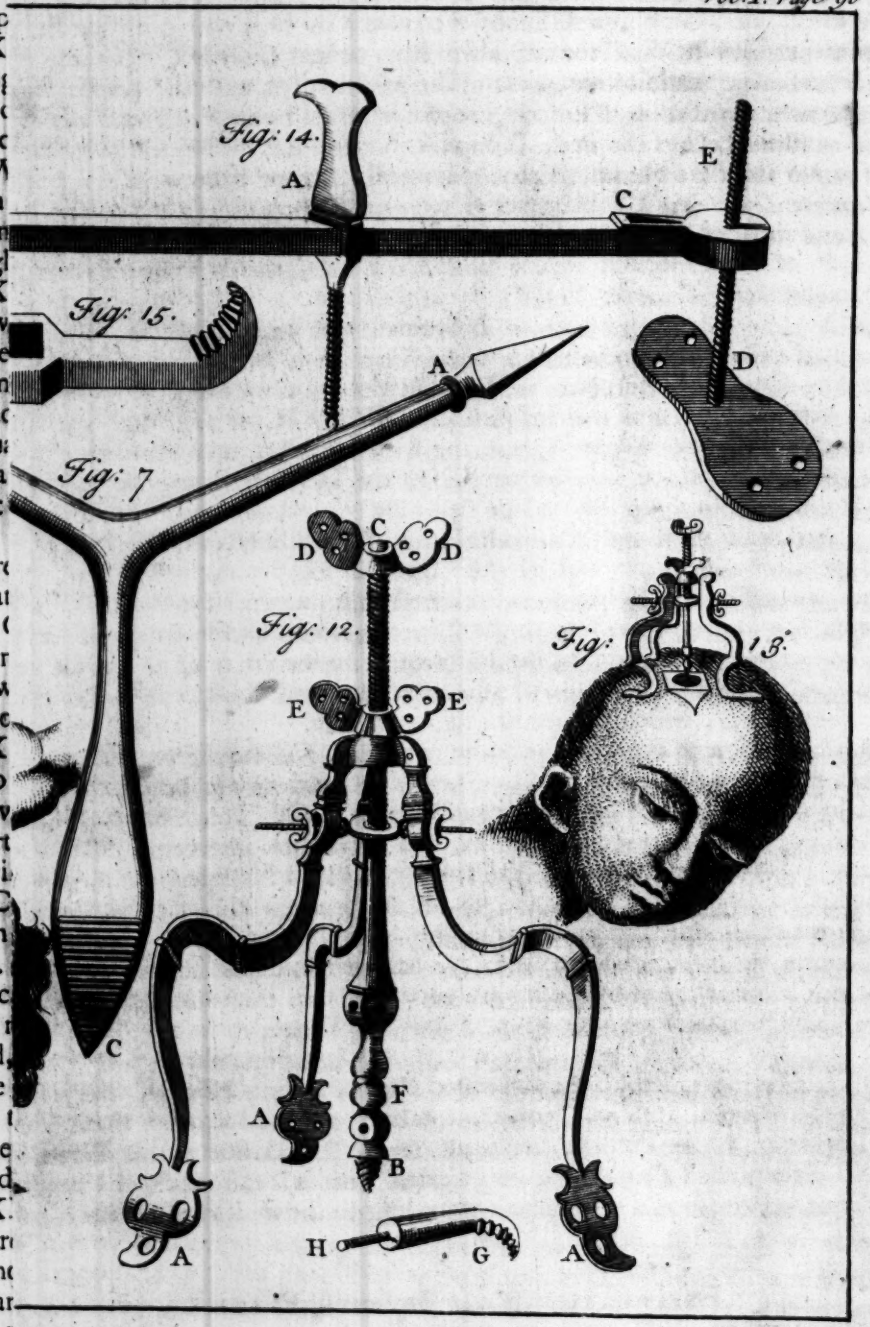
How ſlight Depreſſions in Infants are to be treated.

How a larger Depreſſion is to be treated.

How a fractured *Cranium* is to be treated.

A particular kind of Elevatory with three Feet.



applying it is this; the feet of this Inſtrument are applied to the ſound Parts of the Head, and the Screw B C, by frequently turning round its handle D D, will preſently lay hold of the depreſſed Part of the *Cranium*, eſpecially if you have before-hand made a ſmall hole in the middle of it with the Awl at *Fig.* 2. upon turning the Screw E E, the Trepan is raiſed by degrees, and with it the depreſſed Part of the *Cranium*. You will conceive this more clearly by examining *Plate* VII. *Fig.* 13. but if any opening ſhall appear between the fractured Parts of the *Cranium*, it will be better to take off the pointed end of the Inſtrument, and in its room fix the Elevatory G, by the Screw H, about the Part at Letter F of *Fig.* 12. and by the aſſiſtance of this, the depreſſed Part may be raiſed, as we taught above.

XXIX. HILDANUS deſcribes an Inſtrument for this Intention, which is a much ſimpler Inſtrument than that which we have juſt ſhewn you, and a very convenient one for the purpoſe, *See* FAB. HILDAN. *Cent.* II. *Obſ.* 4. We have given you a deſcription of this Inſtrument in *Plate* VII. *at Fig.* 14. you ſhould be provided with the Auger A, and the Hook at *Fig.* 15. through either of which, according as you ſhall ſee neceſſary, the Lever B C may be paſſed after the Inſtrument is fixed upon the depreſſed Part of the *Cranium*. The Plate D is to be placed upon the ſound Part of the Head, laying Bolſters under it to prevent Pain; then by raiſing the end of the Lever at B, the depreſſed Part of the *Cranium* will be gently elevated and reſtored to its natural ſituation. You will obſerve a Joint at the extremity of the Lever C, to accommodate the Plate D to the Convexity of the Head in ſome Parts of it, which may be alſo raiſed or depreſſed by the Screw E. If you pleaſe, you may make the Lever longer than it is repreſented here, which will add to its force. HILDANUS's Elevatory.

XXX. But if any Part of the Bone is entirely ſeparated from the reſt, and drove ſo deep into the Cavity of the *Cranium*, that it cannot be elevated or extracted by the methods which we have already propoſed, you muſt perforate the neighbouring ſound Part with a *Trepan*, and divide the intervening Part with a fine Saw, *Fig.* 9. as deep as you ſhall think you can with Safety; after this you may cut it entirely through with the Chiſſel and Leaden Mallet at *Fig.* 10, 11. Having made an opening in this manner, you will have a full command of any Splinters or foreign Bodies that are driven into the *Cranium*. Caſes that require this laſt method of operating are very rare, but they are no leſs neceſſary, though the Operation requires great Pains and Dexterity in the Performance of it. A particular way of removing Splinters.

XXXI. Having raiſed up the depreſſed Parts of the *Cranium*, and reſtored them to their natural ſituation, you muſt take great care to ſecure them from a freſh Depreſſion; the Patient ſhould lie on the ſound ſide of his Head, the fractured or depreſſed Part ſhould be guarded with a Braſs or Steel Plate, and the wounded Part ſhould be treated according to the Rules which we have already laid down. How to ſecure the Parts in the Situation you have reſtored them to.

EXPLANATION *of the* SEVENTH PLATE.

Fig. 1. *An artificial Eye* made of Glaſs or Silver, painted after the Life; this may be introduced into the Orbit, and ſupply the place of the natural Eye, and prevent the deformity that will enſue upon the entire loſs of that Organ.

Fig. 2. *An Awl*, or ſharp Inſtrument to perforate the external Table of the *Cranium.*

Fig. 3, 4, 5. Different Forms of *Rugines*, or *raſping Chiſſels*, to ſcrape the *Cranium*, or other Bones.

Fig. 6. Shews how the *Depreſſion of the Cranium* in an *infantile State* may be relieved by ſticking Plaſters.

Fig. 7. A, a quadrangular, or pointed Steel Inſtrument, to perforate the external Table of the *Cranium.* B, an Auger. C, an Elavator to raiſe depreſſed Bones of the *Cranium.*

Fig. 8. Another Elevator for the ſame uſes with the former.

Fig. 9. A ſmall fine Saw; and *Fig.* 10. a ſmall Rugine, which may be uſed with or without the handle deſcribed to that at *Fig.* 3.

Fig. 11. A wooden Mallet, the Head of which is filled with Lead.

Fig. 12. An Elevator with three Feet. See above, *N.* 28.

Fig. 13. deſcribes the method of applying this Inſtrument.

Fig. 14. HILDANUS's Elevator. See above, *N.* 29.

Fig. 15. A Hook belonging to HILDANUS's Elevator.

How extravaſated Blood is to be diſcharged from the CRANIUM.

Diſorders occaſioned by Extravaſation of Blood.

XXXII. In the Injuries of the *Cranium*, that we have been deſcribing, that is, in Contuſions, Fiſſures, Depreſſions and Fractures, one or more of the Blood-veſſels that are diſtributed upon the *Dura Mater* is frequently divided; the Blood that is diſcharged by this accident greatly oppreſſes the Brain, and diſturbs its offices; this frequently brings on violent Pains and other Miſchiefs, and at length Death itſelf, unleſs the Patient be timely relieved: If the extravaſated quantity of Blood be ever ſo ſmall it will certainly corrupt, and affect the *Meninges*, and the Brain itſelf with the ſame Diſorder; from hence will proceed violent Inflammations, Delirium, Ulcers, and what not? even Death itſelf ſooner or later. And this will frequently be the caſe after a violent Blow upon the *Cranium*, though the Bone ſhould eſcape without any Injury.

Where the Blood is ſpilt.

XXXIII. In theſe Injuries of the Head, the Blood is ſpilt either between the *Cranium* and *Dura Mater*, or between the *Dura* and *Pia Mater*, or between the *Pia Mater* and the *Brain*; or laſtly, into the *Sinuſes of the Brain.* Each of theſe caſes are attended with great danger, but the deeper the Extravaſation happens, ſo much greater will the danger be.

How to diſcover an Extravaſation of Blood in the *Cranium.*

XXXIV. You may ſuſpect that Blood is extravaſated in the cavity of the *Cranium* from the violence of the Symptoms which ſucceed, if the Patient lies ſtill without Senſe or Motion; if Blood flows from the Mouth, Ears, or Noſe; if the Eyes are much inflamed and ſwelled; if vomiting ſucceeds; when upon the remiſſion of theſe Symtoms the Patient complains of a remarkable heavineſs of Head, a Sleepineſs, Vertigo, Blindneſs, Spaſms, and Diſorders of this kind. When the quantity of extravaſated Blood is very conſiderable, and oppreſſes the *Cerebellum*, the Patient dies upon the ſpot; but when the Extravaſation is not in a very large quantity, or at leaſt does not affect the *Cerebellum*, Life ſtill remains, but the Symptoms related above come on: Sometimes theſe Symptoms come on very ſlowly, and [illegible] numbers of Perſons, who have appeared at firſt to have been but ſlightly wounded, have died in this manner after ſome time,

time, contrary to all expectation. Therefore I cannot help again admoniſhing the Surgeon, that after violent Blows of the Head, though no violent Symptoms ſhould immediately urge, yet he ſhould be very cautious in delivering his Prognoſtic, and not to be too haſty in declaring the Patient out of danger. But when violent Symptoms immediately enſue, you may always be ſure that there is an Extravaſation of Blood, though no great Injury appears upon the external Part of the Head.

How to diſcover the Part in which the Blood is extravaſated, though there appears no external Wound.

XXXV. If you can find no Fiſſure, or Contra-Fiſſure in the *Cranium*, nor even any external Injury upon the Integuments of the Head after a violent Blow, you will find it difficult to determine in what part of the Head an Extravaſation is ſeated; it will be proper therefore, 1. To ſhave the Head all over, that you may be the better able to examine it; for if any Part is ſofter than ordinary, or enlarged, or red from a ſtagnation of Blood, it is plain that this is the Part which received the Injury; you may alſo examine Perſons who were preſent at the accident, from whom you may frequently get light into the affair; but if you are ſtill left in the dark, 2. Cover the whole Head after it is cloſe ſhaved with an emollient Plaſter, laying over it medicated Bags well heated; this application will in a few Hours produce Tumor and Softneſs upon the injured Part. 3. Sometimes the Patient, though he lays ſpeechleſs, and to all appearance ſenſeleſs, will be continually clapping his hand to the aggrieved Part. 4. If either ſide of the Patient has loſt Senſe and Motion, and is become paralytic, it is an apparent ſign, whatever ſome may think to the contrary, that the Injury was received on the contrary, on ſound ſide. *See* MORGAGNI *adverſaria Anatomica* VI. *& Diſſert. de Reſonitu, Argentorat.* 1722. *Edit. Pag.* 23. If you diſcover any Wound in the Skin, you ſhould enlarge it with the Knife, till you come at the Injury in the *Cranium*, whether Depreſſion, Fiſſure, Contra-Fiſſure, or Fracture.

How the injured Part is to be treated.

XXXVI. When you have diſcovered the ſeat of the Injury, the firſt Intention is to diſcharge the extravaſated Blood, and then to clean the Wound, and remove all Splinters or extraneous Bodies. Many Writers in Surgery adviſe the inſtant uſe of the Trepan, to make way for a diſcharge of the extravaſed Blood; but ſince this is a difficult and dangerous Operation, and many have recovered without having recourſe to it, I ſee no reaſon for attempting it, unleſs we are driven to it by abſolute Neceſſity. Therefore I think it is beſt to try firſt the force of attenuating and dividing Medicines in this caſe.

How inſpiſſated Blood ſhould be attenuated.

XXXVII. With this Intention, 1. Open a Vein, and draw away as much Blood as the ſtrength of your Patient will admit; this will take off the Impetus of the Veſſels, and prevent the Extravaſation of more Blood. 2. Preſcribe a pretty briſk Purge, to leſſen the quantity of Fluids: For which purpoſe you may alſo give ſharp Clyſters. 3. Foment the Head with medicated Bags, and apply a melilot Plaſter to it. 4. Endeavour to rouſe the Patient by volatile applications to his Noſtrils, ſuch as *Sal volatile Oleoſum*, *Spiritus Salis Ammoniaci*, *vel Spiritus Cornu Cervi per ſe.* Laſtly, 5. Give frequently attenuating Fluids warm, ſuch as Infuſions prepared *ex Theâ*, *Betonicâ*, *Salviâ*, *Roriſmarino*, *Lavendulæ Floribus*, *Ligno Saſſafras*, and the like.

XXXVIII. This method does not immediately procure the deſired effect, therefore it muſt be continued for ſome time, and the Preſcriptions frequently repeated; and more particularly when the Symptoms ſeem by degrees to abate.

The repetition of bleeding in this caſe may ſeem ſtrange to ſome, but it muſt be to thoſe who are ignorant of the good effects it produces by leſſening the quantity of Fluids, and by reſtoring the courſe of the ſtagnating Blood. If the Patient finds a little relief from the firſt bleeding, it will be proper to repeat the Operation a ſecond and a third time, eſpecially if he is young and athletic, and to apply remedies which we have recommended above in the Intervals, till the Diſorder is entirely removed.

Sometimes the Trepan is neceſſary.

XXXIX. But when you find, notwithſtanding theſe applications, that the Symptoms rather encreaſe than abate, you will be obliged to make a Perforation in the *Cranium* with the *Trepan*, that there may be a Paſſage for the diſcharge of the confined grumous Blood. When you cannot diſcover the Part of the Head which is principally affected, you muſt perforate the Skull in ſeveral places, till you hit upon the right. I ſhall teach the manner of performing this Operation, and the methods of healing the Wound in another Part of this Work, which treats profeſſedly of *Chirurgical Operations*.

Principal Writers on Wounds of the Head.

XL. If you deſire to ſee Hiſtories of Cures of Wounds of the Head, conſult HIPPOCRATES *de capitis Vulneribus, cum* ARANTII & PAAWII *Commentariis*, & CELSUS *de eodem Argumento*. BERENGARIUS *de Fracturâ Cranii*, SCULTETUS *in Obſervationibus* 1 *ad* 23. HILDANI *Obſervationes variæ*, SCULTETUS *de Capite læſo*. BELLOSTIUS *in Chirurgo Noſocom*. WOYTIUS and WALTHERUS *de Capitis Vulneribus*, and ſeveral others; but particularly amongſt the modern Writers, ROHAULT's Book on Wounds of the Head, called *Traité des Playes de Tête*, 4*to*. 1720. and LE DRAN *in his Chirurgical Obſervations*.

CHAP. XV.

Of Contuſions.

A Contuſion what?

I. A *Contuſion* is any hurt of the Body that is inflicted by a blunt Inſtrument, and ſince in this caſe an infinite number of ſmall Veſſels and Fibres are injured and broken, a Contuſion may properly be ſaid to be a Congeries of an infinite number of exceeding ſmall Wounds. It is well enough called by the GREEK PHYSICIANS *Ecchymoſis*, and by CELSUS *Vulnus Colliſum*, *Lib.* V. *Cap.* 26.

Differences.

II. Contuſions may be diſtinguiſhed into ſeveral ſorts; 1. Some may be called *ſimple Contuſions*, that is, when only the ſoft external Parts are injured: Some are *compound*, when the internal or bony Parts alſo partake of the Injury. 2. So ſome Contuſions are ſlight, others of great conſequence; this depends upon the cauſe of the Injury, and the nature of the Part injured. 3. Laſtly, ſome Contuſions are ſo circumſtanced, which is very wonderful, that the internal Parts ſhould be violently affected, whilſt the external Parts remain whole and unhurt; for we are experimentally taught, that a Man may receive a Blow with a blunt Weapon, or even with a naked Hand, upon the Head, Breaſt or Belly, which ſhall occaſion inſtant Death, though there ſhall appear no external ſigns of Injury. *See* BOHNIUS *de Vulner. Lethal. Sect.* I. *Cap.* I.

Cauſes of Contuſions.

III. Contuſions are uſually occaſioned, 1. By violent Blows given with blunt Weapons, ſuch as Staves, Bludgeons, or Stones. 2. The ſame will happen from

from a Fall upon the Stones, or any other hard Body. 3. Contuſions are occaſioned by the Body being preſſed between two Doors, by Preſſes, Screws, Mills, Wheels, and ſuch like Machines; for by Accidents of this kind the Veſſels are either entirely broken, or the Blood is violently ſqueezed out of them.

What ſucceeds a Contuſion of the ſoft Parts.

IV. When the ſmall Veſſels and Fibres have been broken by a Contuſion, the Fluids that were contained in them will be forced out: Hence will proceed Obſtructions, Corruption, Inflammation, and Ulcers, or even Gangrene, and ſeveral other Miſchiefs, in proportion to the violence of the Cauſe, and the nature of the affected Part. When the external Parts are contuſed, the Skin at the ſame time remaining whole, the Blood will ſtagnate under it, and occaſion red, black, and livid Spots, which we call a *Sugillation*; from whence ariſe ſeveral other Miſchiefs, and, if this happens near a Bone, a *Caries*.

Of the Bones.

V. When a bony Part is the ſubject of a Contuſion, then, 1. The ſame Miſchiefs will enſue from the Injury inflicted upon the *Perioſteum*, which we have already deſcribed as happening to the *Pericranium* in Wounds of the Head; but when this Diſorder, 2. Is accompanied with a Fracture, the ſame Miſchiefs will enſue, which uſually attend fractured Bones: If the Injury is in the Bones of the *Cranium*, you may expect all the Miſchiefs that follow upon a Fracture of that Part, of which we have largely ſpoken above in the preceding Chapters. Laſtly, 3. When the medullary Juice of the Bones is affected, you may expect very violent Diſorders, whether the Bones are fractured or not; for the Blood which is diſcharged out of the Veſſels that are ſent to the *Medulla* will preſently corrupt, and by corroding the Bones will bring on *Caries*, Ulcers, and incurable *Fiſtulæ*, which will make it neceſſary to take off the Limb to ſave the Life of the Patient; for the medullary Juice is in the ſame condition in theſe caſes with the Brain in Fractures or Contuſions of the *Cranium*.

Of the Joints and Muſcles.

VI. Contuſions of the Joints uſually bring on violent Pains and Inflammations, Convulſions, Gangrene, Sphacelus, Rigidity of the Limbs, and *Caries*. The ſame will ſometimes happen from Contuſions of the muſcular Parts. When the internal Parts are contuſed, great Miſchiefs uſually enſue; but that depends entirely upon the nature of the injured Part: Sometimes Inflammations, Rupture of the Veſſels, Varices, Aneuriſms, Hæmorrhages, Stagnation of the Fluids, Corruption, Gangrene, Suppuration: And ſometimes, as a neceſſary attendant upon theſe, Death. When the Head receives a conſiderable Contuſion, the Senſes are then taken away, the Limbs become either convulſed or rigid, and Death preſently follows, in the manner we have already explained, treating upon Wounds of the Head. If the Contuſion is upon the Thorax, a difficulty of breathing follows, with ſpitting of Blood, fainting Fits, Inflammation and Ulcers of the Lungs, which uſher in Death. After Contuſions of the Abdomen you may expect vomiting of Blood, Inflammations, Suppurations, or Gangrene of the Viſcera, and at length Death [a]. If any internal Veſſel is burſt by the violence of a Blow, it is no wonder if the Patient dies upon the ſpot,

[a] An Inſtance of this kind happened in the Year 1726. at a Village near *Helmſtadt*; a School Maſter there beat one of the Children very ſmartly, with a Stick of no great ſize; but the Boy died in a few days afterwards: Upon opening him, the Viſcera of the Abdomen appeared grievouſly bruiſed and lacerated. I opened another Boy ſoon afterwards, who was killed by a Blow, and found his Liver divided quite through the middle, though there appeared no external Injury.

though

though there be no mark of Violence left upon the external Parts. Laſtly, if the Eye is contuſed, Tumor and Inflammation will ſucceed, and frequently Loſs of Sight.

How to diſcover the bruiſed Parts.

VII. Contuſions may be examined, 1. By the Eye, when they are inflicted upon the external Parts of the Body; Tumors are formed, the injured Parts are diſcoloured, at firſt becoming red or black, then livid, yellow, green, and at laſt black again: If the Contuſion is not very conſiderable, the Parts will of themſelves recover their natural colour. 2. When the Contuſion is not within the reach of the Eye you muſt feel for it; an unnatural ſoftneſs of the Limb, or a fluctuation of the extravaſated Blood under your Fingers, will pretty clearly point out the injured Part to you. 3. Pains and Rigidity of the contuſed Part will make the ſame diſcovery. Laſtly, 4. You may form ſome Judgment of the degree of the Injury received, from conſidering the manner in which it was given, and the Size and Nature of the inflicting Inſtrument. You will judge what internal Parts are injured by the Symptoms which ſucceed, and by obſerving which of the Functions of the Body are diſturbed or deſtroyed.

Prognoſis.

VIII. What we have ſaid above concerning the nature and neceſſary effects of Contuſions of each particular Part, will give the Surgeon great light in forming his Prognoſtic; nevertheleſs it will not be improper to ſubjoin a rule or two in this place. Slight Contuſions are attended with little or no Inconvenience or Danger, beſides diſcolouring the Skin, and even that deformity is of a very ſhort date: For the ſtagnating Blood is preſently licked up again, and the Spots vaniſh; but in larger Contuſions, where there is a great collection of ſtagnating Blood in the muſcular Parts, an Abſceſs, Gangrene, or Sphacelus will eaſily follow. Contuſions of the internal Parts are extremely dangerous, and the degree of danger encreaſes in proportion to the violence of the Contuſion, and the conſequence of the Part in performing the neceſſary offices of Life. If inſtant Death does not happen in this caſe, yet it is uſually attended with ſuch dangerous Inflammations, that the Patient conſumes away by degrees, and very rarely eſcapes. Contuſions of the Bones, particularly of their *Medulla*, and of the Joints or Ligaments, are very dangerous; but the Contuſion of the *Cranium*, from the Vicinity of the Brain, exceeds the reſt in the miſchievous conſequences which attend it, as we have largely enough explained above.

Cure of ſlight Contuſions.

IX. Your principal care in the cure of Contuſions ought to be to divide the inſpiſſated Fluids, and at the ſame time to prevent the Parts from ſuppurating, and being affected with Gangrene. There are ſeveral methods ſucceſsfully uſed for the cure of ſlight contuſions; for example, when a Tumor ariſes in the Forehead from a Fall, which very frequently happens to Children, it will eaſily be cured by fomenting it *cum Vino calido, Spiritu Vini vel ſolo, vel camphorato, Aquâ Reginæ Hungariæ*, or by applying cold Water or Vinegar mixed with Salt to the Part, or by clapping a broad Piece of Money, or a Plate of milled Lead upon the Tumor, and faſtening it on with a very tight Bandage. Perſons of very tender habits of Body muſt be treated very tenderly, nor will Patients of this Make be baulked in their Expectations, if they apply Linen Rags dipped in freſh warm Urine to Tumors of this kind.

Of larger Contuſions.

X. Larger Contuſions may be dreſſed with Decoctions *ex Scordio, Sabinâ, Abrotono, vel ſeorſim vel junctim, in Vino, vel Aquâ ſalſâ*. You will find great benefit by applying a Sponge dipped *in Decocto Saponis Veneti in Urinâ recenti*.

Your

Your end alſo will be ſufficiently anſwered by applications of *Aqua Calcis, cum admixto Spiritu Vini camphorato, vel Acetum Lithargyriſatum, item Acetum cum Semine Carui coctum.* Theſe Remedies are all to be applied warm.

Of violent Contuſions.

XI. When the Contuſion is ſo violent, that it is apparently impoſſible to divide the ſtagnating Fluids, and return them into the Circulation; and the Parts are haſtening to become gangrene, you muſt ſcarify them without delay; by this means you will ſet the ſtagnating Fluids at liberty, and prevent all danger of Suppuration or Gangrene.

What is farther to be done.

XII. Having done this, you are in the next place to apply proper Fomentations, or medicated Bags, made in the manner we directed in *Chap.* XIV. *N.* 10. or according to the following Preſcription. ℞ *Rad. Bryoniæ,* ℥ ii, *vel* ℥ iii. *Herbæ Sabinæ—Scordii—Abrotoni, Arboris Vitæ, ſive Thuyæ vel Abſinthii, ana* M ii. *Singula iſta minutim diſſecentur, affuſiſque Vini circiter Libris duabus, per Horæ quadrantem probè decocta, per panniculum laneum percolantur. Debinc Saponis Veneti vel Hiſpani aliquot Unciæ huic Decocto probè calida admiſcentur, complicatique panniculi Lanei ex eodem expreſſi per ſingulas ferè Horas læſæ Corporis parti calidè ſuperinjiciantur.* Rub the Tumor well with hot Cloths before you foment it, which will keep the Blood in its fluid State; or if it is already concreted, it will divide it, and make it fit to return into the Veſſels, or at leaſt to eſcape through the inviſible Pores of the Skin. If you cannot be ſupplied with Wine to make your Fomentation, you muſt uſe ſalt Water, which, if you are not near the Sea, you may make of common Water two Pints with the addition of a handful of Salt. If any one is better pleaſed with the form of a Cataplaſm, he may prepare a very cheap, and no leſs uſeful one in the following manner. ℞ *Pulver. Radic. Bryoniæ, Saponis Veneti, ana* ℥ iii. *coq. in Aquæ recentis vel Aquæ ſalſæ q. s. ad Conſiſtentiam Cataplaſmatis.* This will have ſtill greater efficacy if you add *Gummi Galbani vel Ammoniaci* ℥ i. *in Vitell. Ov. q. s. ſolut.*

Of internal Remedies and a proper Diet.

XIII. Where the Contuſion is of any conſequence, you ſhould never neglect the Admininiſtration of internal Medicine; and here your Intention is to promote the diſcharge of Sweat and Urine, by preſcribing dividing and attenuating Decoctions and Infuſions to be drank plentifully: Theſe may be prepared *ex Theâ, Betonicâ, Veronicâ, Salviâ, Roriſmarino, Ligno Saſſafras, Herbâ Arnicâ, vel Petroſelini Radicibus.* The efficacy of theſe Medicines in dividing inſpiſſated Fluids is ſcarcely to be conceived, eſpecially if you now and then add to a draught of one of theſe Infuſions a Drachm of *Venice* Soap. You will find no leſs aſſiſtance from the *Pulvis ad Caſum Auguſtanorum*, or from *Sperma Ceti, vel ſolum vel cum admixtis Sanguine Hirci, Mumiâ, Cancrorum Lapidibus, in Pulverem redact.* Theſe may be given to a Drachm at a Doſe, in a draught of any of the former Infuſions. In plethoric habits you ſhould never forget to open a Vein, and repeat it as often as you are threatened with an approaching Abſceſs or Gangrene; the Patient muſt abſtain from Fleſh and ſtrong Liquors, living wholly upon Broths and thin Spoon-meat.

What ſtill remains to be done.

XIV. The Fluids that were collected together by the Contuſion being pretty well diſperſed by the methods we have recommended above, the remaining part of the cure, which principally regards the Wound, (which frequently accompanies this caſe) is eaſily performed, by filling it up with Pledgits ſpread with a digeſtive Medicine, and laying on a warm Plaſter over the Dreſſings, which will

ſave the Surgeon the trouble of preparing Cataplaſms and Fomentations for this purpoſe, and anſwer his end as well. The *Emplaſtra Diaſaponis, Diachylum, de Meliloto, de Spermate Ceti, de Galbano*, all anſwer this Intention, or if you pleaſe you may uſe the following ℞ *Empl. de Meliloto* ℥ iiii. *Galban. puri ſolut.* ʒ ii. *Farin. Rad. Bryon.* ℥ i. *Flor. Sulphur. Æthiop. min. ad* ℥ ß. *Ol. Chamomill. q. s. m. f. Emplaſtrum.* In the mean time, the Regimen which we directed above, both with regard to Medicine and Diet, ſhould be ſtrictly obſerved. Contuſions are cured in this manner much eaſier than by Suppuration or Scarification: Having anſwered the Intention of diſperſing the ſtagnating Fluids, and cleaning the Wound, nothing remains but to forward the union of it by applications of the vulnerary Balſam, and at laſt dry Lint, as we have already adviſed for healing other Wounds.

How the Parts are to be treated when they ſuppurate.

XV. It ſometimes happens, when the contuſed Parts lie very deep, or the Surgeon is ignorant of his buſineſs, or the Patient refuſes to ſubmit to proper treatment, that the ſtagnating Fluids will corrupt and ſuppurate: When the Suppuration is begun, it muſt be forwarded, 1. By emollient Cataplaſms prepared *ex Rad. Malv. Althææ, Liliorum Alborum, Herbæ Malvæ, Althææ, Parietariæ, Mercurialis, Brancæ Urſinæ, Meliloti, Verbaſci, Ficubus, Lini Semine, Fœnogræco, Farinis Variis, Micis Panis cum affuſo Aquâ vel Lacte coctis ad Pulticulam, Butyroque, Adipe, Oleiſve emollientibus, Lini ſcilicet, Chamæmelæ, Liliorumque Oleis dilut.* Theſe are to be applied to the Part as hot as they can be well born. 2. Sometimes in this caſe it will be proper to mix warm Medicines with Emollients, ſuch as *Cepæ ſub Cineribus toſtæ, Fermentum Panis, varia Gummata, Galbanum ſcilicet, Ammoniacum, Bdellium, Opoponax in Vitell. Ovor. ſoluta.* Theſe are to be mixed with the emollient Ingredients which we enumerated above; for example, ℞ *Herbæ Malvæ, Althææ, Parietariæ, Meliloti, ana* M i. *conciſa coquantur in Aquæ ſimplicis q. s. ad Conſiſtentiam Cataplaſmatis. Adde Cinnar. ſub Cineribus Aſſatarum* ℥ iiii. *Galbani Vitell. Ov. ſolut.* ʒ ii. *Ol. Lilior. albor.* ℥ i ß. *Farinæ Sem. Lini q. s. ad Conſiſtentiam.* Theſe applications are to be repeated till the Suppuration is thoroughly formed. In ſmall Contuſions the *Emplaſtrum Diachylum cum Gumm.* will ſufficiently anſwer this Intention.

How the Matter is to be diſcharged.

XVI. When the whiteneſs and ſoftneſs of the Tumor evidently diſcover that the Matter is thoroughly formed, and fit to be diſcharged, you may lay open the Part with your Knife, and afterwards digeſt and heal the Wound in the ſame manner as we have frequently directed above.

How a Gangrene and Sphacelus are to be treated.

XVII. Large Contuſions are ſometimes attended with violent Inflammation or Gangrene; in this caſe make frequent and deep Inciſions upon the Part, and dreſs the Wounds *cum Theriacâ Spiritu Vini Camphorato dilut.* applying warm Fomentations externally, not omitting the internal Medicines preſcribed at *N.* 13. (but I ſhall treat more largely upon this Head in *a Chapter upon Gangrene and Sphacelus*) When the Parts are ſphacelated, that is, entirely corrupted and mortified, the Limb muſt be entirely taken off, in the manner we ſhall ſhew you when we come to deſcribe *Chirurgical Operations.*

Cure of internal Contuſions.

XVIII. When the internal Parts are contuſed, the Patient requires immediate aſſiſtance; therefore in theſe caſes the Surgeon ſhould endeavour to prevent miſſing, by frequent Blood-letting, by gentle opening Medicines and Clyſters, *Chap.* XIII. *N.* 37. by preſcribing the warm Decoctions and Infuſions which

we

we directed above at *N.* 13. if the Diſeaſe is curable, theſe methods will prevent Suppuration or Mortification. Theſe parts do not admit of Inciſion, and the uſe of abſorbent Powders: Such as *Lapides Cancrorum, Sanguis Hirci, Cornu Cervi, Pulvis ad Caſum*, and the like, are trifling in this caſe. We have already ſufficiently explained how Contuſions of the Head in particular ought to be treated, in the preceding Chapter.

Contuſions of the Eye.

XIX. When the Eye is contuſed by any accident, it will be entirely deprived of Sight, except the Contuſion is very ſmall, and proper Remedies are inſtantly applied: If the Eye therefore has received a ſlight Contuſion, you may waſh it frequently for the firſt day with cold ſpring Water, covering it with Linen Rags wet with the ſame; on the next day rub it externally *cum Spiritu Vini camphorato*, covering it with Stuphs wrung out of vinous Decoctions *ex Euphraſiâ, Veronicâ, Hyſſopo, Salviâ, Florib. Chamæmel. & Semin. Fœnicul.* If you cannot get theſe Herbs you may apply Bolſters dipped *in Vino calido*, renewing them often. If the Contuſion is large, or the Patient of a plethoric habit, you ſhould open a Vein.

Of violent Contuſions of the Eye.

XX. If the Contuſion of the Eye is ſo violent that you can plainly ſee the extravaſated Blood through the *Cornea*, and all objects appear red to the Patient; open a Vein either in the Foot or Neck, as you ſhall think moſt convenient; foment the Eye with Stuphs wrung out of the Decoctions which we preſcribed above, and order him to bathe his Feet in warm Water two or three times in a day, adviſing him alſo to obſerve the ſame Regimen with regard to Diet and internal Medicine, which we deſcribed at *N.* 13. By the ſtrict obſervation of theſe Rules he will recover his Sight, if the Diſorder be not become deſperate, eſpecially if you frequently drop warm Pigeon's Blood into the Eye. If theſe attempts to diſperſe the ſtagnating Blood are fruſtrated, you may very probably ſucceed by making an opening in the *Cornea* with your Lancet; the manner of doing this to advantage you will find deſcribed in *Chap.* 60. of the ſecond Part of this Work, which treats profeſſedly of *Operations*.

CHAP. XVI.

Of Venomous WOUNDS, *and thoſe that are made by the Bites of Animals.*

Poiſonous Wounds are difficult to diſtinguiſh.

I. WE are informed by ancient Tradition, that the INDIANS, and the barbarous Nations all over AFRICA, poiſon their warlike Weapons; this Cuſtom has long ago been laid aſide by the EUROPEANS, as inhuman. Wounds that are inflicted by Weapons of this kind, are attended with extreme danger: For as this ſort of miſchief is in a great meaſure concealed and unexpected, there is no room to make uſe of proper Precautions to prevent or remedy the Evils that will enſue from it.

For the Marks of them are very uncertain.

II. For though ſeveral *Phyſicians* and *Surgeons* have aſſerted that you may diſtinguiſh Wounds made by a poiſonous Weapon, not only by the filthy ſtench of the wounded Parts, and the unuſual Colour of the Diſcharge that proceeds from them, to wit, yellow, green, livid, and black; but particularly by the increaſe of Pain, by the extravagant degree of Tumor and Inflammation

that they are attended with; Palpitation of the Heart, Swoonings, Spaſms, Diſtorſion or Rigidity of the Limbs, cold Sweats and Shiverings with which the Patient is conſtantly afflicted in this caſe: Nevertheleſs, if I may be allowed to judge, I muſt determine theſe Symptoms to be altogether doubtful and uncertain; for what Surgeon does not know that all theſe Symptoms may be brought on either by the bad habit of the Patient, or from the nature of the wounded Part, if it is nervous or tendinous; or, in a word, from an hundred other cauſes, where Poiſon is no ways concerned?

Of Bites. III. You have much greater certainty of a mixture of Venom in the Wound, when it is made by the Bite of a *venomous* or *mad Animal*, (for there is ſcarce any Species of Animals but what is at ſome times ſubject to Madneſs) eſpecially of a Dog, a Cat, a Wolf, an Ape, a Man, a Serpent, a Scorpion, or of any other venomous Inſect: But ſince the coldneſs of our Climate renders us very rarely ſubject to Injuries from the Bites of venomous Serpents, or indeed of any other venomous Animal but a *mad Dog*, it will be moſt to our purpoſe to treat chiefly of that ſubject, at the ſame time, not entirely neglecting the deſcription of other Wounds inflicted by Biting. And firſt we ſhall ſpeak of the Bites of Animals who are not mad.

Bites of Animals who are not mad. IV. Bites of enraged Animals are attended with very grievous conſequences, though they are not afflicted with Madneſs. [a] CELSUS has long ago taught us that the Bites of a [b] Man, an Ape, a Cat, a Dog, or of any wild Beaſt or other Animal, frequently bring on terrible Miſchief: In that Paſſage of his where he ſays, *omnis* [c] *ferè morſus quoddam Virus habet*, "almoſt all Bites whatever have "ſomething poiſonous in them," he is not to be underſtood as if he had aſſerted, that all Wounds made by Bites have actually ſome Particles of Poiſon, properly ſo called, inſtilled into them; but rather as ſpeaking of the bad Symptoms which muſt neceſſarily enſue from the violent Laceration and Contuſion of the Muſcles, Nerves, Tendons, Ligaments and Bones, by the Bite of a large Dog, a Horſe, a Wolf, or a Bear, or any other large Animal: If the Wound is ſlight, encourage the diſcharge of Blood from the Part, by preſſing it with your Fingers, ſucking it with your Mouth, or by the application of Cupping-glaſſes, or by enlarging the Wound with a Lancet; waſh it afterwards with camphorated Spirits of Wine, and apply Bolſters to it dipped in the ſame Liquor, repeating it every three or four Hours till all Danger of Inflammation is gone off. CELSUS recommends Salt, as the beſt Remedy for the Bite of a Dog, if it is applied dry, and well rubbed in; if the Wound is very conſiderable, it will be abſolutely neceſſary to enlarge it with the Knife, unleſs the Opening is

[a] *Lib.* V. *Cap.* 27. *N.* 1.

[b] PANAROLI *Pentec.* 2. *Obſ.* 42. HILDANI *Cent.* I. *Obſ.* 84, & 85. *ac de morſu equi*, ibid. *Cent.* II. *Ob.* 86. SEREN. SUMMONIC. *Cap. de hominis & ſimiæ morſu.*

[c] In ſeveral Editions of CELSUS you will find FERÆ for FERE, *omnis autem* FERÆ *morſus quoddam virus habet*; but I think the other Reading preferable to this, for CELSUS does not treat in this place of the Bites of wild Beaſts alone, for they are very uncommon caſes, but of the Bites of a Man, an Ape, and particularly of a Dog, (which Animals he manifeſtly diſtinguiſhes in this place from wild Beaſts) which Bites he deſcribes as bringing on violent Miſchiefs, eſpecially if the Animal is much enraged. Therefore CELSUS very properly in an extenſive ſenſe declares, *omnem* FERE *morſum habere quoddam Virus ſive Venenum*: Which opinion is not applicable to wild Beaſts alone, but to all Animals whatever for Reaſons which we ſhall preſently lay down. MORGAGNI is of the ſame opinion with me concerning the Interpretation of this Paſſage, which he explains, according to his uſual cuſtom, with great Learning and Perſpicuity. *In Epiſtol. in* CELSUM, *pag.* 126.

already

already very large; the diſcharge of Blood alſo ſhould be encouraged in this caſe, by the ſame methods which we adviſed in the foregoing. I lately ſaw the bad effects of a neglect of this Practice, in the caſe of a Boy who was bit by a Dog near the Knee, and was ſeized with a violent Inflammation over the whole Leg and Thigh, for want of a proper Evacuation of Blood at the Wound: The Wound ſhould be diligently waſhed with Wine, warm Spirits of Wine, or ſalt Water, dreſſing it up with Lint and Linen Bolſters wet with the ſame Liquors; theſe Dreſſings are to be repeated frequently every day, to prevent a violent Inflammation: You may dreſs afterwards with Honey, or a digeſtive Ointment, and heal with a vulnerary Balſam, as in other Wounds.

How to know a mad Dog.

V. In order to know whether your Patient has been bitten by a mad Dog, it is neceſſary that we ſhould firſt ſettle the Marks by which a mad Dog is diſtinguiſhable from other Dogs. When a Dog is mad, he foams at the Mouth, and lolls out his Tongue, claps his Tail betwixt his Legs, and runs up and down without ceaſing, as if he was purſued; he makes a hoarſe noiſe when he barks, and is afraid of all Animals that come in his way, ſnapping at every thing he meets, even at his own Maſter, upon whom he uſed to fawn; other Dogs are afraid of him, and avoid him.

Miſchiefs that enſue from the Bite of a mad Dog.

VI. Men that are bit by a mad Dog are uſually afflicted with grievous Diſorders, ſometimes ſooner, ſometimes later, in proportion to the Malignity of the Poiſon that is imbibed by the Wound, and to the ſtate of health that the Patient enjoys at the time he receives the Bite. When once the Poiſon begins to exert itſelf, the Patient is ſeized with great Anguiſh, continual Groanings, Sighing, acute Pains and Fever.

Prognoſis.

VII. If nothing is done to relieve this Diſorder, the Patient is ſeized with an *Hydrophobia* about the ninth Day: A miſerable circumſtance, ſince he is continually afflicted with Thirſt, and at the ſame time labours under ſuch a dread of all Fluids, that he durſt not ſatisfy it, but rages and foams like a Dog, till being quite ſpent he [a] expires: Therefore in this caſe it well behoves us to be early in our applications to Wounds of this kind: For when the *Hydrophobia* appears, nothing is to be looked for but certain Death [b].

How the Wound is to be treated.

VIII. Where ſhall find a remedy for this dreadful Diſorder? many are of opinion, that to puſh a Man unawares into a Pond or River is a certain Cure; this was a common remedy in the times of CELSUS, *Lib.* V. *Cap.* 27. Some think it ſufficient to bathe the wounded Limb frequently in cold Water for ſeveral days together, and to dreſs the Wound with ſome of the mad Dog's Hair; they imagine this laſt method cures a Man by *Sympathy*, as they affect to call it. Others throw the Patient into Water when the *Hydrophobia* is coming on, and endeavour to force him to drink againſt his Will: For by this means they aſſert that they take off his Thirſt, and the dread of Water at the ſame time. On the other hand, almoſt all the moſt experienced Surgeons recommend the following method as the ſafeſt and moſt worthy to be tried, to wit, to enlarge the Wound with the Knife, to promote the Flux of Blood, to clean it *cum Aquâ*

[a] There have been ſeveral Inſtances where the Poiſon has lain dormant in the Blood for one, two, nay for ſeveral Years, and has at length broke out, and carried off the Patient after the uſual manner. WEBSTER has given us ſeveral ſurpriſing Relations of this kind in his Book *de Magiâ*.

[b] It will be worth your while to conſult VERDRIES upon this Subject, *in Lib. de æquilibrio ment. & corpor. circa finem.* And MARESCOTTUS *de Variolis, pag.* 57. where he treats of the *Hydrophobia*.

ſalſâ, vel cum Aceto & Theriacâ, and to endeavour to draw out the Poiſon by Cupping-glaſſes; and, laſtly, if the Texture of the Part will permit it, that is, when only the common Integuments or fleſhy Parts are wounded, they apply the actual Cautery to the Wound, and dreſs it afterwards like other Burns. AQUAPENDENS, *in Operat. Chirurg. pag.* 331. adviſes this method to be uſed to all Wounds that are infected with Poiſon; but in theſe laſt caſes you ſhould firſt diligently enquire, whether the Arrow or other Weapon, by which the Wound was inflicted, was poiſoned or not, or whether the violence of the Symptoms give you ſufficient reaſon for ſuch conjecture; for where it remains doubtful whether the Weapon was poiſoned or not, you ſhould deal more tenderly with your Patient, and not proceed to the uſe of the actual Cautery, but treat the Wound after the method juſt deſcribed.

Another Method.

IX. Other Surgeons in poiſoned Wounds, eſpecially in the Bite of a Dog, make a very tight Ligature above the Wound, to prevent as much as poſſible the return of the Blood by the Veins of that Part, and then they enlarge the Wound with the Knife, and waſh it well *cum Aquâ ſalſâ, vel cum Aceto & Theriacâ*; if the Wound is deep they make uſe of a Syringe: But if the ſituation of the Part will admit of it they chuſe to burn it with the Cautery, ſince many are of opinion that no one can be pronounced to be abſolutely freed from all danger of the *Hydrophobia*, and other Symptoms, who have not been cauteriſed; but where the Part will not admit of the uſe of the Cautery, you muſt be content with cleanſing the Wound in the manner we have juſt deſcribed, laying on the *Emplaſtrum de Ranis cum Mercurio*, or ſome Plaſter of that kind; in plethoric habits you may open a Vein.

Kœmpfer's Method of curing the Bites of Serpents.

X. KŒMPFER, who was one of the chief Phyſicians in the *Eaſtern* Countries, and well verſed in the nature of the venomous Serpents, with which that Part of the World abounds, tells us in his *Amœnitat. Exotic. pag.* 581. and in his *Itiner. in Chinam & Japan*, that he has frequently cured the Bites of theſe Animals without the help of the Cautery, by making a Ligature upon the Limb above the injured Part, and ſcarifying the Wound, anointing it well afterwards *cum Theriacâ*, and covering it with a Cataplaſm made of the ſame Medicine, giving alſo a Doſe of it frequently by the Mouth; he declares that he never loſt a Patient, where he had an opportunity to treat him in this method. As this is a ſimple, eaſy method, and proves by experience to be a very ſafe one, I ſee no reaſon why we ſhould not prefer it to one attended with great Cruelty and Pain in the Operation.

Other Methods.

XI. Some anoint the Wound with the *Oleum Nucis Moſchatæ* inſtead of the *Theriaca*. Others apply a *Toad* to the Part, either alive, or dried and ſoftened with Vinegar, imagining that this Animal has a ſpecific virtue in extracting Poiſon from a Wound. Others again are extremely fond of the *Ophites*, or ſerpentine Stone, called *Pedro del Cobra*, which they are told is found in ſome Species of Serpents in the INDIES; they affirm that if you lay this Stone upon a Wound made by the Teeth of a venomous Serpent, it will imbibe all the Poiſon, and if you afterwards ſoak it in Milk, it will depoſit it in that Fluid. Compare with this place, KŒMPFER *in Amœnitat. Exotic. pag.* 57, *& ſeq.* though he only adviſes it *contra Serpentum ictus*; but the celebrated VALLISNERIUS, in his Book *de Generatione, pag.* 141. denies that it is equal to the cure of a Bite from an *Italian* Viper, therefore I think very little credit is to be given to it.

The

The following Cataplaſm is in great reputation with ſome for this Intention, ℞ *Cepæ ſub Cineribus aſſatæ, & Allii Bulbum unum, Theriacæ, Fermenti Panis valentiſſimi, ana* ʒi. *Sinapi* ʒſs. *quæ ſingula infuſo Aceto calido in formam Cataplaſmatis probè conterantur, Vulneríque ſuperimponantur.*

XII. After theſe applications have been continued for a day or two, the Wound ſhould be dreſſed *cum Melle vel Unguento digeſtivo admiſt. Ung. Ægyptiaco, vel Mercurio Præcipitato Rubro bis quotidie.* It may be kept open with theſe dreſſings for ſome Weeks, or for about forty Days, till the Poiſon is thoroughly diſcharged; for you ſhould always be very careful not to heal Wounds of this kind too ſoon, eſpecially where they have not been cauteriſed: For the principal part of the cure in theſe Wounds conſiſts in keeping the Part open, and encouraging a Diſcharge, wherefore CELSUS always recommends very ſtimulating Medicines. The reſt of the Cure.

XIII. Beſides the external Remedies that we have adviſed, it will be proper to preſcribe ſtrengthening Medicines and Sudorifics to be given internally, according to the ſtrength of the Patient. Some of the Ancients, according to CELSUS, put the Patient into a warm Bath, and ſweated him there as long as he could bear it, with the Wound uncovered, that the Poiſon might diſtil out in greater quantities, waſhing it well afterwards with Wine, which is an enemy to all Poiſons. When they had repeated this Proceſs for three days, they thought him out of all danger. It would be very convenient in this caſe to give him now and then a glaſs of Wine inwardly, and a Spoonful or two of good Vinegar, in which ſome Sage had been boiled, with a Drachm of *Theriaca* in it, and between whiles to adminiſter Draughts of *Infuſum Scordii vel Salviæ in Aquâ calidâ*, putting the Patient into a warm Bed, or into a Bath, to encourage him to ſweat largely; this ſhould be done for ſeveral days ſucceſſively: You may give for ſeveral mornings *Valerianæ Radicis* ʒi. in the room of *Theriaca*, which I find is much the practice in ITALY; or *Radix Gentianæ*, in the ſame quantity, with a draught of one of the Infuſions which we juſt now preſcribed. Some, after the Example of GALEN and BOYLE, inſtead of *Theriaca*, give *Sal volatile Viperarum, vel ex Cancro Fluviatili combuſto paratum*, which they have ſo great an opinion of, that they venture to affirm it to be *an infallible Specific* in this caſe. Several amongſt the Moderns recommend the *Scarabæus Maialis melle conditus & tritus, vel Scarabæi Succus*, which they ſuppoſe to have very great efficacy in deſtroying Poiſon, and preventing its bad effects. Others have no leſs opinion of the Virtues of the Heart, Liver or Brain of a mad Dog or Wolf, which they affirm to have very ſalutary Effects if given to the Patient in time; but for many reaſons I think this by no means a juſtifiable Practice. PARÆUS directs *Garlick* to be given frequently; but I think the moderate uſe of ſome generous Wine, and the juice of Citron and mild acid Fruits will be of great ſervice, not only in ſtrengthening the Patient, but in deſtroying the Poiſon. The internal Method.

XIV. The ſame methods of cure which we adviſed above, *N.* 9, *and* 10. will be ſerviceable againſt the ſtings of *Scorpions*, or other venomous Animals. The Scorpion affords an eaſy remedy againſt his own ſting: For ſome bruiſe him and lay him upon the Wound, others drink him in a glaſs of Wine, *See* CELSUS, *Lib.* 5. *Cap.* 27. *N.* 3. where he ſays, *Venenum Serpentis non guſtu, ſed in vulnere nocet.* Some dreſs the injured Part with Oil of Scorpions, which they eſteem

eſteem a ſure method of Cure; others do nothing but draw Blood from the Arm. The Ancients in this caſe hired Men to ſuck the Blood and Poiſon out of the Wound, which they did, ſpitting it out again, without injuring themſelves in the leaſt. See the above cited Paſſage from CELSUS; but the Patient at the ſame time did not neglect the uſe of the methods which we preſcribed above, both with regard to internal and external Medicines and Applications. The beſt cure for the *Sting of Bees* or *Waſps* is *Acetum cum Theriacâ*, or *Theriaca cum Spiritu Vini*, or *Bolus Armena cum Aceto*. The method of curing a Gangrene ariſing from the Bite of a Horſe, may be ſeen in HILDANUS, *Cent.* II. *Obſ.* 86.

THE SECOND BOOK OF THE FIRST PART. OF FRACTURES.

CHAP. I.

Of FRACTURES *in general.*

I. UNDER the Name of *Fracture*, ſpeaking in general terms, we conceive every ſolution of continuity in the Bone, either from an internal or an external Cauſe, whether the external cauſe was a ſharp or blunt Inſtrument; but as we uſually call thoſe Injuries of the Bone that are brought on by acute Inſtruments *Wounds of the Bone*, ſo we properly call thoſe *Fractures of the Bone*, where the Bone is broken by the force of a blunt Inſtrument; therefore Fractures generally happen when any part of the Body where a Bone is ſituated receives a violent ſhock, either by a Fall, or a Blow with a piece of Timber, a Stone, or by a ſhot from a Gun. There are alſo Inſtances where this accident has happened from an internal Diſorder, to wit, from the Scurvy, a Caries, or the venereal Diſeaſe, which have rendered the ſubſtance of a Bone ſo brittle, that it has been fractured without any apparent external accident. *See* HEYNE *de Oſſium Morbis, N.* 29. Fractures, what?

II. We may diſtinguiſh Fractures into ſeveral Claſſes or Species; firſt, every Fracture is either *ſimple*, that is, when no other Parts beſide the Bone are injured, or *compound*, that is, when you have at the time ſame a Wound, a Diſlocation, Hæmorrhage, Inflammation, Fever, Caries, or Contuſion of the Bone; or where the Bone appears to be fractured in ſeveral places at the ſame time. Other differences ariſe with regard to the ſituation of the Fracture, ſometimes it happens in the Cranium, Ribs, Vertebræ, ſometimes in the upper or lower Limbs, ſometimes in the middle of the Bone, ſometimes in either of the Extremities. Again, ſome Fractures are tranſverſe, others oblique: In which caſe it frequently happens Different Species of Fractures.

happens that the points of the Bones wound the neighbouring Parts, puſhing quite through the muſcular Fleſh and common Integuments, or at leaſt pricking them grievouſly, and bringing on Pain, Inflammation, Tumor and Spaſms. Violent Contuſions alſo may be claſſed under the head of Fractures: For the Bones in this caſe are frequently broke into Splinters by the falling of any heavy body upon the Part, or by the Preſſure of Mill Wheels, or the Wheels of Carriages.

Of Fiſſures in the Bones.

III. To Fractures of the Bones we may very properly add *Fiſſures*, when the Bones are divided either tranſverſely or longitudinally, not quite through, but cracked after the manner of Glaſs, by any external Force; for although moſt Surgeons have looked upon the mention of Fiſſures as an idle Jeſt, eſpecially of thoſe that are ſaid to be made in a longitudinal direction; and others have paſſed over them ſilently in their Writings, or where they have by chance been mentioned, no method of cure has been directed for them; yet there is not one of them that I know of, who was ever able to demonſtrate the impoſſibility of theſe Fiſſures. All they can pretend to alledge is, that they have never fallen under their Obſervation; but I find Inſtances of this kind of Diſorder, with a method of cure deſcribed for it, in Authors of undoubted credit. *See* HEYNE *de Morbis Oſſium, N.* 29. and particularly that famous *German* Surgeon FELIX WURTZIUS, *in Chirurg. Part.* II. *Cap.* 28. which makes me ſo far from calling the Fact in queſtion, that I think it ought rather to be a ſpur to a young Surgeon to conſider well the marks that WURTZIUS has deſcribed, and to make a more diligent Search after caſes of this kind than has hitherto been made. We ſhall ſpeak more largely to this below.

How Fractures are to be diſcovered.

IV. it is no difficult matter to examine *Fractures of the Bones*, 1. *By the Eye*, when the injured Part is apparently ſhorter than the ſound, or when you ſee that the Patient cannot make uſe of it. 2. *By the Touch*, when you perceive a preternatural Inequality of the Bone, or that it bends in a Part where Nature never intended it ſhould. 3. *By the Ear*, when we hear the ends of the broken Bones cruſh againſt each other upon moving the Limb. But, 4. We may ſtrongly ſuſpect a Fracture of the Part, when it has received a Blow with great violence from a heavy Body. And, 5. We ſhould not neglect to obſerve, that the Parts are more ſubject to this Injury in Winter than in Summer. Laſtly, 6. Sometimes, particularly in Fractures that are made in a tranſverſe direction, the broken Parts of the Bone will immediately of themſelves recover their natural ſituation, and leave very little room to ſuſpect the Diſorder. Therefore it is neceſſary to be very cautious and prudent in forming your judgment in caſes of this kind: If your Patient has entirely loſt the power of moving any Limb, or puts it in action with the greateſt difficulty, after having received a violent Blow upon that Part; or if he feels violent Pain when you handle it, or move it for him, this affords great reaſon to ſuſpect a Fracture; but to make yourſelf more certain in this caſe, it will be proper to take hold of the injured Limb with both your hands, and ordering an Aſſiſtant at the ſame time to move it about, attend diligently whether you cannot hear the broken ends of the Bone rub againſt each other, and obſerve whether you cannot diſcover a preternatural dent or ſinking in any part of the Limb. The motion that your Aſſiſtant makes ſhould be done with great care and tenderneſs.

V. *Fiſſures*

How to discover Fissures.

V. *Fissures in the Bones* are not easily detected, since neither your senses of seeing, feeling, or hearing can give you light enough to determine any thing with certainty in this case; and this seems to be the reason why most Surgeons are deceived in this case, as GOVRIUS well observes in *Chirurgie veritable, pag.* 79. If we will believe those Authors who declare to us upon their own experience that these cases sometimes happen, we shall find there are sufficient signs to discover a Fissure of the Bone: They always suppose a Fissure when you have such violent Pains after any external violence, that the injured Part will not bear handling, and cannot support the Parts above it; when you have more than ordinary Tumor, and these Symptoms do not yield to the usual applications: After this you are to expect violent Inflammations, Suppurations, *Fistulæ*, and *Caries*. These Authors are of opinion that aged Persons are most subject to this Disorder, because their Bones are very brittle. When we consider the nature of a Fissure, we shall not be long in guessing whence all the bad Symptoms attending it can arise; for the Bone being once cracked, the Blood and Sanies which fill up the Vacancy will presently putrify and corrupt the *Medulla*, the neighbouring Parts, and at last the Bone itself; which will easy produce the mischiefs we have described.

Disorders attending a fractured Bone.

VI. Great variety of Mischiefs attend a fractured Bone, which differ, 1. With regard to the injured Part, and the nature and disposition of the neighbouring Parts. 2. With regard to the manner in which the Fracture is made; for oblique Fractures, and those whose Splinters or Points wound and vellicate the neighbouring Parts, are much more painful and dangerous than transverse Fractures: Fissures are attended with more or less danger in proportion to their size, as appears from what we have delivered above; but, 3. We may judge of the mischief that is likely to attend a Fracture, from the number of pieces into which the Bone is broken. And, 4. by observing whether the Fracture happens in the middle of the Bone, or at either of its extremities. The principal inconveniences that attend a Fracture are these, the Patient loses the use of the Limb, the lower part of the Limb will be contracted by the Muscles, which will make it appear distorted and deformed; the Laceration of the *Periosteum*, and the Vessels of the *Medulla*, bring in great danger of *Fistulæ* and *Caries*; when the Nerves are pricked and irritated by Splinters or Points of the broken Bone, the Patient suffers great Pain, Convulsions, Inflammation and Fever; if any Vessels suffer Pressure, the circulation of the Blood is retarded, therefore no wonder if Inflammations, Abscesses, Gangrene, and Death, are the consequences; if the Pressure is upon a Nerve, the Part to which it was determined becomes paralytic, losing both sense and motion, and by degrees usually wastes. Sometimes whilst the Bone is uniting, the broken parts are supplied in too plentiful a manner with Juices, and the Callus is formed irregularly; which occasions deformity in the Limb. When you have a Wound in the fleshy parts in conjunction with a Fracture in the Bone, you will most likely be troubled with a violent Hæmorrhage.

Prognosis in general.

VII. The Surgeon ought to be very cautious in delivering his Prognostic concerning Fractures; he should avoid being too hasty in promising a quick, easy and certain cure, lest his Art should be overcome by accidental Disorders, and he be accused of Knavery or Ignorance; for I don't know how it happens, the most unskilful Persons in Surgery speak of fractured Bones, as cases of the

leaſt Importance, and make nothing of promiſing a Cure; whereas it is undoubtedly true, that it is ſometimes impoſſible to reſtore a broken Limb to its former ſhape and ſtrength, though your Surgeon is perfectly maſter of his Art. Therefore ſince Fractures are ſometimes cured eaſily, but at other times are attended with the worſt of conſequences, it will be an argument of diſcretion in a Surgeon to deliver his Prognoſtic in ſuch a manner that it may not regard the fractured Part alone, but may give warning alſo of the accidents that are likely to happen to the neighbouring Parts, or which may be occaſioned by the Age, or the bad habit of Body of the Patient, or by any other circumſtances; and in this he ſhould always take care not to be over haſty.

In particular. VIII. I would recommend the following Obſervations to the Surgeon, to wit, 1. Simple Fractures, when you are called ſoon after the Accident, are much eaſier cured than Fractures that are complicate with an external Wound, a Diſlocation, a great Contuſion, an Hæmorrhage, a *Caries*, or with any other grievous Diſorders. 2. Fractures are more eaſy or difficult of cure, according to the Part on which they happen; thus ſmall Bones, ſuch as the Clavicles or Ribs, are uſually cured in twenty days, the Radius in thirty; whereas the Os Humeri, or the Tibia, require from thirty to fifty days, and the Os Femoris does not thoroughly unite till the ſixtieth or ſeventieth day. 3. Men of good conſtitutions, and in the prime of life, are cured ſooner, and with leſs trouble, than Perſons of a bad habit of body, or advanced in years.

IX. Where the ſituation of the Bone is not altered by the Fracture, or the broken Parts ſtart very little, they are much eaſier replaced, than where they are entirely ſeparated from each other, and a great ſpace intervenes between them: Tranſverſe Fractures admit of an eaſier cure than oblique ones: Fractures near the Articulations are attended with worſe conſequences than thoſe which are made about the middle of the Bone; for where the Fracture happens near either extremity of the Bone, the Joint frequently ſuffers, which occaſions loſs of motion in the part; the Ligaments alſo and Tendons are uſually bruiſed in this caſe, from whence ariſe violent Pains, Inflammations and Convulſions, and ſometimes even Gangrene and Death itſelf.

X. When two Bones of the ſame Limb are fractured, the cure is more difficult than when this accident happens only to one of them. When the Bone is broken into ſeveral pieces, the Patient will ſeldom eſcape Gangrene or Sphacelus, at leaſt the cure will require a great deal of time, and the Limb will never entirely recover its ſhape; therefore, when a Surgeon ſees this, he ought always to forewarn the Patient, or his Relations, what danger he apprehends.

XI. Where the broken Bones are inſtantly reduced, your cure will be performed with greater eaſe, than where they have been for ſome time ſeparated. Therefore where the Surgeon is called a conſiderable time after the Fracture has been made, he cannot promiſe to reduce the Bones eaſily, or to make a ſpeedy cure.

XII. When any Parts of great conſequence to the animal Œconomy are ſituated in the neighbourhood of the Fracture, the caſe will certainly be attended with great danger, if not with Death; ſuch are Fractures of the Cranium, from the vicinity of the Brain; of the Vertebræ, from the Medulla Spinalis; of the Ribs or Sternum, the Oſſa Ilei and Pubis, from the ſituation of the Viſcera of the Thorax, and Abdomen. Fractures alſo of the Bones to which the

the larger Arteries or Veins are connected, are more dangerous, more particularly when any Splinter or Point of the broken Bone vellicates or wounds a large Veſſel; for very violent, if not mortal Hæmorrhages muſt neceſſarily enſue, eſpecially when this happens in the Axilla or Groin, which is often the caſe.

XIII. When the ends of the fractured Bone break through the Muſcles and common Integuments, you will find great difficulty in reducing the Bone to its proper ſituation, from the great number of Muſcles, Nerves, and Blood-veſſels that lie in the way, the laceration of which will bring on great miſchiefs, and frequently deformity and weakneſs upon the Limb, eſpecially if it is the Os Humeri, Tibia, or Femur, ſo as to render the amputation of it neceſſary.

XIV. The moſt temperate air and ſeaſon of the Year is moſt convenient for the cure of this, as well as all other Diſorders; ſo the cure ſucceeds more happily in Children and young Perſons than with aged Perſons. When Fractures happen to big-bellied Women, they are ſeldom cured till they have got rid of their burthen.

XV. When the Bone is broken into ſeveral Fragments, the conſequences are generally Inflammations, Suppurations, or Fiſtulæ, which will not admit of any remedy till the Splinters are all removed. If the Fracture is occaſioned by an internal Diſorder, ſuch as a Caries of the Bone, you will find it much more difficult to cure, than when it proceeds from any external Violence; nay, it is frequently an incurable caſe, unleſs the occaſion of it, to wit, a ſcorbutical habit of body, or a venereal taint, be removed.

XVI. When a large piece of bone is driven away by a Piſtol or Muſquet Ball, it is better to cut off the lower part of the Limb, ſince the two ends of the Bone are never likely to unite, than to deceive the Patient with the fruitleſs hopes of a Cure, and weaken him to the laſt degree with the attempt; but when only a ſmall piece of the Bone is carried off in this manner, you may ſafely enough attempt the union of the Parts; but the Limb will be ever ſhorter than the other; and [a] if the Injury is in the Foot, he will be always lame.

XVII. When the Blood inſinuates itſelf through a Fiſſure into the internal part of the Bone, by corrupting there, it produces a Caries, or Spina Ventoſa, incurable Fiſtulæ, Tabes, and Sphacelus, which always require amputation of the Limb, and frequently deſtroy the Patient; the ſame accidents will happen in Fractures of any kind, when the extravaſated Blood mixes with the Medulla, and corrupts it.

XVIII. Fractures of the lower Limbs are much more inconvenient than thoſe of the Arm: Though Diſorders of the upper Limbs are eaſier concealed, whereas thoſe of the lower Limbs appear preſently, eſpecially in Men, from the lameneſs and deformity which they occaſion, which require great care in the treatment of them.

[a] HORSTIUS *in Obſerv. Med. P.* II. *Lib.* IV. *Obſ.* 10. gives us an account of a Man who ſuffered a loſs of Subſtance in the Bone of his Foot, of the ſize of three Fingers breadth; but he cured his Patient without leaving any lameneſs. If the Story is true, it is very extraordinary.

Cure of FRACTURES.

Cure. XIX. The Surgeon's principal care in Fractures is to unite the broken Bone, to which three things are neceſſary; 1. That the Bone be reſtored to its natural ſituation, which is to be done by extending it and replacing it. 2. That after the Bone has recovered its natural ſituation, it be kept there by giving it Reſt, and applying proper Bandages. Laſtly, 3. You are to uſe proper means to prevent, or remedy the Diſorders that uſually attend this accident: The knowledge of Anatomy is neceſſary to perform theſe Intentions; for, 1. The Surgeon muſt be acquainted with the ſituation and ſtructure of the Bones, that he may know whether the injured Limb is ſupported by one or more Bones, whether they are large or ſmall, whether they are firm or ſpongy, whether they are even or uneven, whether one or more Bones are broken at the ſame time. 2. What Muſcles there are in the neighbourhood of the Bone, their ſituation and office. Laſtly, Whether any conſiderable Nerves or Blood-veſſels are near the fractured Part; all which things are abſolutely neceſſary to be known by any one, who expects to ſucceed in the cure of theſe Diſorders.

Of Extenſion. XX. When the fractured Bones maintain their natural ſituation, you are under no neceſſity of extending or replacing the Limb, but of applying a proper Bandage; but when the fractured Parts recede from each other, ſome degree of Extenſion is neceſſary, which muſt be always ſuited to the diſtorſion of the Limb; the greater diſtance there is between the extremities of the divided Parts of the Bone, ſo much ſhorter will the Limb be, from the contraction of the Muſcles, therefore the Extenſion in this caſe ought to be in proportion ſo much the greater; but to prevent the Patient from ſuffering any violence, every thing ought to be done tenderly, and with great care.

How the Extenſion is to be made. XXI. The Extenſion of fractured Limbs ought to be performed in the following manner: 1. The Patient is to be kept firm and ſteady; the poſture of Body to be obſerved at this time differs according to the circumſtances of the caſe: Sometimes the Patient ſhould ſit, either upon a ſtool, or upon the floor; ſometimes it will be better for him to lie, upon a table or a bed. 2. An Aſſiſtant ſhould ſupport the Limb with his Hands, both above and below the fractured Part. 3. The Aſſiſtant who holds the lower Part of the Limb ſhould extend it ſtrongly, till you can replace the fractured part of the Bone; if his Hands alone are not ſufficient to make the required Extenſion, he muſt uſe a Cord, or rather a Napkin; if one Man has not ſtrength enough for this office, you muſt employ two or more. You muſt be very careful not to uſe too great roughneſs in this Operation, leſt you ſhould give your Patient unneceſſary Pain.

Means uſed by the Ancients for Extenſion. XXII. The Surgeons amongſt the Ancients, when they found that neither Hands nor Napkins were ſufficient to make a proper Extenſion, (which was indeed a very rare caſe) contrived ſeveral mechanical Inſtruments to anſwer this end; for this purpoſe you will ſee ſeveral Pullies with Ropes deſcribed; the *Scamnum Hippocratis*, and ſeveral Machines of this kind, which you will find in the Works of the principal Surgeons, ſuch as ORIBASIUS, PARÆUS, ANDREAS A CRUCE, SCULTETUS, and others; but if we attend to the Obſervations of ſeveral modern Surgeons, which are made with great accuracy, we ſhall find that

that Machines of this kind do not act ſufficiently equal in all Parts at the ſame time, and that you will find great difficulty in applying them; beſides, they are not always at hand in times of War, and upon many other occaſions; therefore it is no wonder that you ſcarce ever ſee or hear of theſe Inſtruments amongſt the Surgeons of the preſent times, eſpecially ſince you will almoſt always find your Hands or the Napkin ſufficient for any Extenſion that can be required.

What is to be done where you have Tumor and Inflammation.

XXIII. There remains one Obſervation to be made with relation to the Extenſion of the Limb: When the Surgeon is called at ſome diſtance of time from the accident, when Tumor and Inflammation are come on, it is beſt to defer the Extenſion of the Parts till theſe Symptoms are removed: For it is impoſſible to make a proper Extenſion whilſt the Parts are affected in this manner, without bringing on the moſt acute Pains, Convulſions, and danger of Sphacelus; but if the Symptoms of this kind appear but in a ſmall degree, it is better to attempt the Extenſion of the Parts inſtantly, before the Inflammation encreaſes.

How the Inflammation is to be treated.

XXIV. Where the Inflammation is already arrived at ſo great a height as to forbid the Extenſion of the Parts, the Surgeon's principal care ſhould be directed to aſſwage this Symptom. The ſame methods which we propoſed for diſperſing Contuſions, (*Chap.* XV. *B.* I. *N.* 10, *&c.*) to wit, Blood-letting, looſening the Bowels, adviſing the Patient to drink large quantities of aqueous Fluids, preſcribing ſuch internal Medicines as are known to abate Inflammations, and fomenting the Parts with warm diſperſing Fomentations, will anſwer this Intention: Theſe applications will uſually remove the Inflammation in four and twenty Hours, in ſuch a manner that you may ſafely undertake the Extenſion of the Limb. Inſtead of the foregoing Fomentations you may uſe the following, which very powerfully anſwers the Intention it is preſcribed for. ℞ *Herb. Scordii* M ii, *vel* iii. *Aq. ſimplicis* ℔ i. *Spiritûs Vini* ℥vi. *quæ ſimul per Horæ quadrantem probè decoct. admixtiſque Salis Culinaris* ℥i. *& Nitri* ℥ß *identidem cum Linimentis calida ſupra fractum membrum deliga.* Where the Inflammation is ſo violent, that it will not yield ſufficiently in the time above mentioned, to admit of the Extenſion of the Limb, you muſt repeat theſe applications till they take place, and the Symptoms diſappear.

Of Splinters.

XXV. Sometimes you will be troubled with Splinters of the Bone in your way, which vellicate and prick the neighbouring Part, and will render the reduction of the Bone very difficult. If the Splinters are free, and have no connection to the Bone, you muſt remove them carefully; if they hang by a portion of the Perioſteum, divide them with your Sciſſors: For you will never find that they will eaſily unite again with the reſt of the Bone, but will always give you great uneaſineſs and trouble in your cure: If the Splinters adhere to the neighbouring parts, and do not much impede the reduction of the Bone, it will be beſt to replace the Bone, and to leave the Splinters either to looſen and come away by the Suppuration of the Parts, when they may be taken out without giving the Patient great Pain; or, ſometimes they will grow again to the reſt of the Bone. When they adhere very firmly to the principal parts of the Bone, we ſhould be ſo far from attempting to extract them by Force, that we ſhould endeavour to replace them with the greateſt exactneſs. When this is performed with accuracy, they will frequently unite to the reſt of the Bones; but

but where that is not to be expected, we muſt get them out by degrees in the beſt manner we can.

Of Splinters ſticking through the Fleſh.

XXVI. Where Points of the broken Bones or Splinters ſtick ſo far out, that they are an hindrance to the reduction of the Bone, you ſhould diligently conſider whether you can by any means contrive their reunion to the Bone; which you may judge of by obſerving at what diſtance they are removed from ſome large Bone, and whether there is a large quantity of Fleſh intervening. Where they cannot be reduced or reunited to the Bone, they may be removed by a pair of ſtrong pointed Forceps, *See Plate* VIII. *Fig.* 1. or if they ſtick very firm you may uſe a fine Saw, *Plate* XII. *Fig.* 9. When you have removed the Splinters, you are in the next place to make your Extenſion, and reduce the Bone: Till they are removed, the reduction and reunion of the Bone are generally impracticable.

Of Splinters that are concealed under the Skin.

XXVII. If the Splinters are concealed under the Skin, and you cannot lay hold on them with your Hands, you muſt firſt try if you can reduce them to their natural ſituation; if this cannot be done, make an Inciſion through the Skin, and take them out.

Of Extenſion.

XXVIII. To make a proper Extenſion of the Limb, two Aſſiſtants ſhould be employed, in the manner we deſcribed above at *N.* 21. and the Surgeon ſhould take hold of the extended part, and direct it with his Hands, ſometimes a little outwards, ſometimes a little inwards; now upwards, then downwards; putting it into different Poſitions, as the circumſtances of the caſe ſhall require, till the parts have recovered their natural ſituation.

How to diſcover when the broken Bones are replaced.

XXIX. You may know that the Bones have regained their natural ſituation, by the remiſſion or abſence of Pain, and by obſerving that the fractured Limb is of the ſame figure and length with the ſound Limb. If theſe ſigns of recovery are wanting, you have good reaſon to ſuppoſe that the Operation is as yet ineffectual, and the Extenſion is to be repeated or continued in the manner we have deſcribed, till the Bone is replaced.

They are to be kept in that Situation.

XXX. The Bones being properly replaced, the next thing to be done is to ſecure them in their ſituation, that they may unite to the beſt advantage.

How Fractures are to be bound up.

XXXI. Two things are chiefly required to anſwer this end, 1. To bind it up properly; and, 2. To lay the Limb in a convenient Poſture: The Apparatus for ſecuring the Situation of the Limb is compoſed of *Bandages*, *Bolſters*, and *Splints*[a], which are to be made of thick Paper, of Wood; or, if the Surgeon ſhall think proper, of thin Plates of Copper, Braſs, Steel, Tin, or Lead. *See Plate* VIII. *Fig.* 7. But I think the beſt are thoſe made of Wood or Paper; the manner of dreſſing the Limb is as follows: In the firſt place, a Roller is to be paſſed round the fractured Limb, upon this are to be placed Bolſters, and over them Splints, which are to be ſecured by a tight Bandage over all. In ſome caſes other Inſtruments are neceſſary, ſuch as Boxes made of Paſteboard, Wood, or Metal, to fix the fractured Limb in. *See Plate* IX. *Fig.* 9. Other Inſtruments are alſo neceſſary in this caſe, the particular manner of applying which to the Arms, Legs, and other Parts, we ſhall deſcribe below, when we treat particularly of Fractures; and there you will find that ſimple and compound Fractures require different Bandages; this Apparatus of Inſtruments is required only to ſecure the

[a] The famous PETIT of *Paris* forbids the uſe of *Splints*, and ſupplies their place with *Bolſters*; which I think will by no means anſwer.

Bones

Bones in their ſituation, and to forward their union; it is no wonder therefore that Fractures are ill cured, where the Surgeon is ignorant of the proper methods of applying the Bandage, or the Patient is unruly, and will not give the Limb proper reſt.

XXXII. Although great numbers of Surgeons at this time make it their conſtant practice to apply a Plaſter to the fractured part of the Limb before they make the Bandage, yet the moſt prudent and ſkilful Surgeons amongſt the Moderns entirely reject applications of this kind, as not only uſeleſs, but injurious to the Patient; for theſe Plaſters can do no ſervice without the Bandage: But the Bandage alone, if it is dexterouſly made, is ſufficient to keep the Limb firm; and the Plaſter carries this Inconvenience with it, that it ſtops up the Pores of the Skin, and produces Tumors, and moſt violent Itchings. For my own part, I am entirely of opinion that all kinds of Fractures may be very happily cured without the uſe of Plaſters; and I am confirmed in this opinion by long Experience. But if, notwithſtanding this, any one ſhould be bigotted to the uſe of Plaſters, I would adviſe him to be cautious not to make them of too great length; they ſhould not entirely ſurround the Limb, but a Thumb's breadth of it at leaſt ſhould be left bare, leſt the Blood ſhould be obſtructed in its courſe; which would bring on Tumor, Gangrene, and Sphacelus. The Uſe of Plaſters in this Caſe.

XXXIII. Before we treat more particularly of Fractures, it will be proper to ſay ſomething briefly of the Apparatus of Dreſſings required in Caſes of this kind; and ſince the chief help ſeems to be expected from *Bandages*, we ſhould principally contrive that beſides having the general Properties of a due Length and Breadth, they ſhould alſo be accurately adapted to the ſhape of the broken Limb. In Fractures that are not attended with a Wound, you ſhould apply two ſingle-headed Bandages, each of which ſhould take its beginning upon the injured Part; one aſcending, when it has gone thrice round the Limb, and the other deſcending in a contrary direction, and then aſcending again. Of the Dreſſings.

XXXIV. In order to keep the Parts in their natural ſituation, the Bandage ſhould be made pretty firm; but if you tighten it too much, you will interrupt the circulation of the Blood, and excite Tumors, Inflammation and Gangrene: On the other hand, if the Bandage is made too looſe, it will eaſily come off, and ſet the diſunited Parts at liberty; the middle way therefore is moſt eligible. You will diſcover the mean between theſe two extremities by obſerving a ſlight degree of Tumor below the Bandage, after it has been applied ſome time; if the Tumor encreaſes to a violent degree you muſt looſen the Bandage, if the Parts do not enlarge at all, you muſt bind it ſtill tighter. The Bandage ſhould be neither too tight nor too looſe.

XXXV. *Bolſters* and *Splints* are to be prepared in proportion to the ſize of the fractured Limb; where the Limb is of an unequal ſize in different parts of it, you muſt fold up the Bolſters in the manner we have deſcribed at *Plate* IX. *Fig.* 13. you will by this means be able to apply the Splints to greater advantage; the Splints ſhould be tied on with three Tapes, the middle of which is to be faſtened firſt, and then the others. Of *Bolſters* and *Splints*.

XXXVI. In Fractures of the lower Arm, after you have applied your Dreſſings and Bandage, you may ſuſpend it in a *Scarf* or *Sling*, which is to hang from the Neck. In Fractures of the Leg you may reſt the Limb upon Pillows, *Plate* IX. *Fig.* 5. or in Boxes, *Plate* IX. *Fig.* 9. placing Cuſhions or Pillows. How the fractured Limb is to be placed.

Pillows under it. Theſe Machines alſo are to be faſtened to the Limb with Tapes, that it may remain fixed and immoveable. Some Surgeons faſten a Pillow under the Limb, after the application of the Bandage, in imitation of *Solingius*, *See the Amſterdam Edition printed in* 1698. *Plate* XV. *Fig.* 9. others uſe wooden Boxes, ſuch as you will find deſcribed by SOLINGIUS and SCULTETUS; but the moſt prudent Surgeons prefer Cuſhions or Pillows, for this is not only more uſeful than any other Method, but it is alſo very handy and eaſy to come at. We uſe in this place a ſort of a *Sole*, *Fig.* 6. made of thick Paper or Wood, which keeps the Foot ſteady. This ſhould be lined with a ſoft Bolſter, to keep it from galling or fretting the Foot, *See Fig.* 7. it is to be faſtened to the Pillows by the Tapes *a a a*, *Fig.* 6. a piece of Linen in the ſhape of a Ring is to be ſewed to the lower part of this Bolſter, and faſtened on with the Strings *b b*, *Fig.* 8. This is a contrivance to ſuſpend the Heel, to prevent Inflammation, Pain, and other Miſchiefs that are frequently brought on by laying upon it too long. The two-headed Bandage has its uſe in this caſe; for the Heel may be put into this, and the two Heads of it being ſewed to it will be kept faſt on. The two Heads of the Bandage are to be placed one under the internal, and the other under the external *Malleolus*, to prevent too great ſtricture upon the *Tendo Achillis*, which would bring on acute Pains and Inflammations. You may make an arch over the Foot with a piece of Hoop, which will keep the Bed-cloaths from being troubleſome, and at the ſame time not prevent the application of warm Napkins, or Fomentations to the Part. *See Plate* IX. *Fig.* 10.

How the Patient is to be treated.

XXXVII. The Patient ſhould lie upon his Back, with the Head and the fractured Limb ſomewhat higher than the reſt of his Body; he ſhould have a Rope with a handle at the end of it hang from his Bed's Teſter, that he may be able to take hold of it, and raiſe himſelf up when there is occaſion. If he is of a plethoric habit of body, you will do well to bleed him in the Arm, to prevent Inflammation. The Surgeon ſhould be very frequent in his viſits at the beginning of this Diſorder, and very diligent in examining whether the Bandage, and other applications, remain ſufficiently firm or not: If any thing is out of order he is to correct it; the Regimen with regard to Diet ſhould be the ſame which we adviſed above, when we treated of Wounds. *See Chap.* I. §. 43. *and the following.*

When the Dreſſings are to be opened.

XXXVIII. The firſt dreſſings ſhould be opened and renewed ſooner or later, in proportion to the nature and number of the Symptoms that accompany the Fracture. When the Bandage remains ſufficiently tight, and no bad Symptom appears, you ſhould not looſen it, till the fifth or eighth day; but where you have Inflammations, Tumors, Pains, and violent Itchings, or where the Bandage is too looſe or too tight, which is frequently the caſe, you muſt inſtantly take off the dreſſings, and change them. The ſecond and third dreſſings muſt be performed in the ſame manner with the firſt, with this only difference, that at the third dreſſing, if you perceive no Tumor, you may make the Bandage tighter than before, and by this means prevent the luxurious growth of the Callus, which would occaſion deformity.

Cure of Fiſſures.

XXXIX. When you have reaſon to judge by the Symptoms related above at *N.* 3. *and* 5. that your caſe is a *Fiſſure*, you may follow FELIX WURTZIUS's inſtructions

Inſtructions upon that Head. He always laid his [a] Plaſter which he made uſe of in Fractures, upon the diſordered part, and upon that he placed Splints, and adviſed the Patient to reſt for ſome days, and the Tumor will quickly diſappear. When you find the Tumor advanced in ſize, and ſoft, it is a plain indication that it contains a Fluid which is to be let out by Inciſion. When you have evacuated the corrupted Fluids, you ſhould put a Tent into the Wound dipt in the *Unguentum Fuſcum Wurtzii*, uſing afterwards the Bandage which is applied to Fractures accompanied with a Wound. If we liſten to WURTZIUS, Ointments, Cataplaſms, Fomentations and Baths, are of no ſervice in this caſe, but are prejudicial; for collected Fluids putrifying, corrupt the neighbouring parts and the Bones, and bring on *Caries*, and other grievous Diſorders. The ſymptoms that ariſe from Fiſſures are frequently attributed to Defluxions, or to the Gout. Whoever deſires to be more fully informed of the nature of this Caſe, I would adviſe him to conſult WURTZIUS, *Part.* II. *Cap.* 28. *pag.* 381. *edit. Baſil. ann.* 1687. GOURIUS aſſerts that Fiſſures, when they are juſt made, may be cured by the application of Bandages, without the aſſiſtance of other remedies.

CHAP. II.

Of Diſorders accompanying FRACTURES.

Of a Fracture accompanied with a Wound.

I. IF a Fracture is accompanied with a Wound, after you have reduced the fractured Bones you muſt treat the Wound in the ſame manner with other lacerated Wounds: To wit, firſt the Wound is to be well cleanſed with warm Wine, Spirits of Wine, or ſalt Water; in the next place it is to be filled with dry Lint, to ſtop the Hæmorrhage; then to be dreſſed with digeſtive Ointment [b]; laſtly, it is to be anointed with ſome vulnerary Balſam till it is thoroughly healed. Since it is neceſſary to open the Dreſſings every day in order to cleanſe the Wound, but at the ſame time it would be of very bad conſequence to move the Limb, therefore a great length of Bandage in this caſe would be very wrong, for it would be unneceſſary to lift the Foot up to roll on a long Bandage, which would diſturb the fractured Bones, and throw them out of their natural ſituation; for this reaſon the beſt Surgeons neglect the uſe of long Bandages in this caſe, and apply the Bandage of eighteen Heads, *Plate* IX. *Fig.* 4. which may be looſened at pleaſure. When the Wound is healed, which happens frequently before the Bones are united, you ſhould lay aſide the Bandage of eighteen Heads, and bind up the Limb with long narrow Rollers till the cure is thoroughly perfected: But we ſhall explain this more largely below, when we come to treat profeſſedly of Bandages.

A Fracture attended with an Ulcer.

II. When a Fracture is attended with an Ulcer without a *Caries*, which frequently happens in the Leg or Thigh, it is to be dreſſed every day, after the

[a] The Plaſter is made in the following manner: ℞ *Reſinæ pur. & candidæ* ℔ ii. *Terebinthin. Vulg.* ℔ ß. *leni igne liquefiant, injectâque demum Radic. Ulmanâ Pulv.* ℥ iii. *bene ſubigantur, donec modicè frigeant.* When you have a mind to ſpread it upon Linen or Leather, throw it into hot Water. The Author is very high in his commendation of this Plaſter at *pag.* 320. of his Surgery.

[b] If any Hæmorrhage ſhould happen, you muſt obſerve the methods we deſcribed when we were treating of Wounds.

ſame manner as we directed for a Wound in the ſame circumſtances: Having firſt replaced the Bone, the Limb is to be bound up with the Bandage of eighteen Heads, till the Ulcer is healed. But when the Ulcer is healed, and the fractured parts of the Bone not ſufficiently united, you muſt lay aſide the uſe of the eighteen headed Bandage, and apply long narrow Rollers, as we adviſed above for a Fracture attended with a Wound.

With a *Cariet.* III. Sometimes the Fracture happens upon a part that has been long troubled with an Ulcer and *Caries*; this caſe is very difficult of cure, nay frequently it admits of no cure at all. Very few writers in Surgery have laid down any directions, by which we may be guided in this caſe. PETIT indeed deſcribes the caſe of a *fractured Tibia attended with a Caries*; but as he has related the caſe of the Tibia alone, neglecting to deſcribe it as happening to other parts, he has, in my opinion, by no means ſatisfied the ſubject. However this may ſerve as an example to be imitated in ſimilar caſes, till we ſhall be furniſhed with more perfect ones. A young man who had been for ſome time troubled with an Ulcer and *Caries*, about the middle of the Tibia, had the misfortune to break the Bone in the very part, the Fibula remaining at the ſame time whole, therefore no Extenſion was required in the cure of this Fracture. PETIT, in the firſt place, took off all the vitiated Fleſh that was ſituated near the fractured part, with his Knife, and reduced the ends of the Bone into their proper ſituation with his Fingers, and then filled up the Ulcer with dry Lint, and covered all with the eighteen headed Bandage, as above; after ſome days when the Fever was quieted, he cauteriſed the extremities of the fracturated Bone that were affected with *Caries*, and afterwards took off the carious parts with the Trepan, that the FRENCH call *Trepan exfoliatif*; having done this, he applied Lint to the naked Bone, well ſaturated *cum Tinctura Aloës*. But he dreſſed the fleſhy parts firſt *cum Unguento digeſtivo*, and afterwards *cum Unguento fuſco*, to keep down the luxuriancy of the hard Fleſh, which is very prejudicial in this caſe; and this method of dreſſing he continued for fifty days, till the diſordered parts of the Bone ſeparated from the ſound; he then began to encourage the growth of new Fleſh by applying vulnerary Balſams, and healed both the Bone and Ulcer after the uſual method.

A Fractured Thigh with a *Caries.* IV. But the caſe is attended with far greater difficulties when the Fracture happens upon an ulcerated part, attended with *Caries* in the Thigh; which caſe I find entirely neglected in PETIT's book of Fractures. I knew a Student of about twenty years of age, who had been troubled for many years with an Ulcer and *Caries*, in the middle and internal part of his Thigh, near the ſituation of the crural artery. The Fleſh in this part was ſo thick that the *Caries* did not appear, and the vicinity of the great Artery prevented us from enlarging the Ulcer with the Knife, or from cauteriſing the Bone, ſo that all the Medicines which were applied had no effect; at length as he was walking about, the Thigh broke in this diſordered part, without the aſſiſtance of any external force. What ſhould we do now? we were prevented from enlarging the Wound, or cauteriſing the Bone, by the reaſons I juſt mentioned: And though we replaced the Bone, and applied a proper Bandage, yet it would never unite, but the Patient dragged on a miſerable life. Therefore it is worth our ſerious conſideration, what is the beſt method of cure for Fractures of this kind when they happen in the Thigh, Arm, or other parts where the Bones lie

lie concealed, and cannot be laid bare with ſafety; but this is rather to be wiſhed for than expected.

V. The Surgeon has done his duty in the treatment of a Fracture, when he has diligently replaced the Bones, and taken care to preſerve them in that ſituation; for nature has provided for the reſt, by ſupplying the divided parts with a Callus, to wit, a ſort of a Jelly or liquid viſcous Matter ſweats out from the ſmall Arteries and bony Fibres of the divided parts, and fills up the Chinks or Cavities between them: This firſt appears of a cartilaginous ſubſtance, but at length becomes quite bony, and joins the fractured parts ſo firmly together, that the Limb will often make greater reſiſtance to any external violence with this part, than with thoſe which were never broken: In the ſame manner as we frequently ſee it happen to pieces of Wood well glued. Of the Callus.

VI. But as the new Fleſh in Wounds will frequently ſprout up too faſt, ſo will the Callus in Fractures, and by this means render the Limb uneven and deformed. Where this is the caſe, and you ſee plainly that you cannot prevent it, you had beſt inform your Patient of it in time, leſt he ſhould blame his Surgeon as the Author of the Deformity. For it cannot always be prevented or remedied, nor can you take off the luxuriancy of a Callus as you can of the Fleſh, for ſeveral reaſons of conſequence, therefore when once it is formed it remains without cure. Its growth.

VII. But ſome meaſures may be taken to prevent the Callus from exceeding its due bounds, by making the Bandage ſomewhat tighter than ordinary, and wetting it firſt with Spirits of Wine. This will not only keep the viſcous Matter within its bounds, but will alſo forward its induration. Which may be obſerved in the Tibiæ of Men and the Arms of Women, as thoſe parts are more frequently expoſed to view. When once the Callus is indurated, we have no Medicine that will take it down or deſtroy it. Nevertheleſs there are ſome who pretend that it is to be diſperſed by the *Emplaſtrum de ranis Vigon. cum Mercurio*, tying a plate of Lead over it. The Callus grows ſometimes faſter, ſometimes ſlower, according to the ſize of the fractured Bone, the habit of the Patient's Body, the temperament of the Air, and laſtly, in proportion to the Patient's Age: When the latter comes on but ſlowly, ſome Surgeons place great confidence in the Patient's taking OSTEOCOLLA, half a Drachm at a Doſe. How to prevent the Luxuriancy of the Callus.

VIII. Violent Itching is beſt prevented by removing oily fat remedies, and therefore the Plaſters themſelves, from the Limb; for they are compoſed of ſuch particles that they ſtop up the inſenſible Pores of the Skin. If the Itching remains after the removal of theſe applications, you may waſh the part with warm Wine, Oxycrate, or Spirits of Wine, covering it up with ſoft, fine Linen. If Bliſters riſe upon the part, they ſhould be ſnipt with the Sciſſors. To prevent violent Itching.

IX. Inflammations are to be treated in the manner we adviſed above in *Book* I. *Chap.* XV. but to remove Pains and Convulſions, you ſhould diligently attend to what we laid down in deſcribing the cure of Wounds, but above all you ſhould be very accurate in replacing the fractured Bones, and in obſerving whether they maintain the ſituation which you reſtored them to: And if you obſerve any Splinters quite free from the neighbouring parts, you ſhould inſtantly remove them, and endeavour to lay the Limb in an eaſy poſture. In theſe circumſtances you ſhould not neglect to open a Vein, and to apply emollient and diſperſing Cataplaſms and Fomentations, preſcribing at the ſame time Medicines Of Inflammation, Pain, and Convulſion.

to be given internally with this intention, and adviſing the Patient to obſerve a proper Regimen with regard to his Diet. Without obſerving theſe rules, violent Inflammations, Sphacelus, and Death itſelf, will frequently enſue.

How a *Gangrene* is to be treated.

X. If the Inflammation is ſo violent as to threaten a *Gangrene* of the Part, you muſt bleed inſtantly, lay aſide the long narrow Bandages, and apply the Bandage of eighteen Heads, uſe Fomentations prepared *ex Aquâ Calcis, & Spiritu Vini Camphorato, eſſentiâ Aloës & Myrrhæ; vel ex Spiritu Vini Camphorato & Sale Ammoniaco*, or the remedies we recommended above, treating of Fractures, and the Chapter on *Convulſions*. But if the Part is already affected with *Gangrene*, you muſt make frequent and deep Scarifications, to ſet the ſtagnating Fluids at liberty, not neglecting at the ſame time the Fomentations we recommended above. When the *Gangrene* has penetrated ſo deep into the Parts that it is beyond the reach of Fomentations, and begins to be ſphacelated, you muſt take off the Limb, to ſave the Life of the Patient.

Of Hæmorrhage.

XI. If the Fracture is attended with a conſiderable diſcharge of Blood, you ſhould diligently examine whether the Hæmorrhage proceeds from a Vein or an Artery. Whether the Flux of Blood is to be ſtopped by Preſſure, by the help of dry Lint, Bolſters, and Bandages; or by ſtyptic Medicines, or by making a Ligature upon the injured Veſſels, or laſtly, by the actual Cautery, as we have taught above, *Chap.* II. on the Cure of Wounds. After the Blood is ſtopped, the Bones are to be replaced, extraneous Bodies are to be removed, and the Limb bound up.

Of Palſy and Waſting of the Limb.

XII. If a Relaxation of the Nerves, or Waſting of the Limb, ſucceed a Fracture, there are very little hopes of help. However it will be adviſeable (1) to rub the Limb well with hot Cloths; (2) with ſpiritous Medicines, ſuch as *Spirit. Formicar. Lumbricor. Matricalis, C. C. Sal. Ammoniac. Eſſentia Euphorbii, Caſtor.* and others. (3) To foment the Limb with warm Fomentations and Baths made *ex Vino Herbiſq; corroborantibus, Aromaticis ac Nervinis, vel Thermis naturalibus.* (4) Laſtly, the beſt remedy, in my opinion, is to wrap the tabid Limb up in the ſkin of an Animal that is juſt killed, and remains in its natural heat: For by this means the Flux of the Blood and nervous Juices to the Part, is very much excited; and more particularly ſo when you preſcribe at the ſame time nervous and ſtrengthening Medicines to be given internally.

Stiffneſs of the Joint.

XIII. When the Joint is become rigid and inflexible, which Diſorder the *Greeks* call an *Anchyloſis*, if it is occaſioned by a diſcharge of the Juices of the broken Bone, into the Joint, which concretes there inſtead of forming a Callus in the fractured Part, this caſe will turn out very difficult to cure; but if this Diſorder is occaſioned by having kept the Joint for a long time without action, or from a Concretion of the Juices that are ſecreted in theſe Parts to make them ſlippery and eaſy to move; it will be very proper to foment the rigid Part with emollient Fomentations and Baths; to rub it frequently with Oils and Fat of Animals, or with emollient Ointments; and to move it backwards and forwards frequently with your Hands, till it ſhall recover its natural faculty of moving[a].

Fracture with Diſlocation.

XIV. You have frequently a Diſlocation as well as Fracture of the Bone, in one and the ſame Limb. When this is the caſe, the Luxation muſt be re-

[a] For the cure of an *Anchyloſis* ſee LE DRAN, *Obſ.* 93, 94.

medied

medied in the firſt place, and then the fractured Parts may be reſtored to their natural ſituation: Each of them muſt be dreſſed with a proper Bandage. Sometimes the Fracture happens ſo near the Head or Articulation of the Bone, that it is impoſſible to fix your Hands or Inſtruments to make a proper Extenſion: In this caſe, the Fracture is firſt to be attended to; which muſt be cured before you can attempt to remedy the Luxation; though you ſhould be very careful, during the Cure of the Fracture, to foment the luxated Limb *cum Spiritu Vini, vel ſolo, vel Camphorato, vel & Aceto calefacto.* This method may keep the part free from Inflammation and Tumor. I will not pretend to affirm that this method of Cure is always to be depended upon; for it frequently happens that the luxated Parts are to be reduced by no Art: But as this is the only probable method of relieving the Patient, and as there are frequent inſtances of its being attended with Succeſs, even where the Luxation has been of ſome Months or even a Year's ſtanding, I think it ought by no means to be rejected.

In what manner Limbs are to be broken again, when they have been ill ſet.

XV. If a fractured Limb appears crooked and deformed after the Cure has been performed: Which accident happens either from the negligence of the Surgeon, or from the imprudent and reſtleſs behaviour of the Patient, I know of no other probable method of reſtoring the Limb to its former ſhape and beauty, than by making a ſtrong Extenſion of it, and breaking it in the part where it is juſt united: By this means the Parts may be replaced in a more proper manner. Great care and circumſpection is required in the treatment of the ſecond Fracture: When the Deformity complained of is but ſmall, and the Callus entirely indurated, or where the Patient is in years and infirm, I ſhould not adviſe this method of cure to be attempted; ſince it is not only attended with great Pain, but with great Danger alſo. On the other hand, when the Callus is tender, and the Patient young and vigorous, I think this Operation may be fairly attempted. In the mean time it is neceſſary to obſerve here, that before you undertake this Cure, you muſt endeavour to ſoften the Callus, by uſing emollient Baths, Fomentations, and Ointments, for ſeveral days.

CHAP. III.

Of FRACTURES *in particular.*

The connection and argument of this Chapter.

I. SINCE we have already treated Fractures of the Bones in general, it remains now that we ſpeak to particular Fractures. And firſt, in this Chapter we ſhall treat of thoſe that happen in the Head. We ſpoke largely enough above in *Chap.* XIV. of Fractures of the Cranium; therefore we ſhall now proceed to deſcribe other kinds of Fractures.

Fracture of the Noſe.

Fracture of the Noſe.

II. In the Noſe, both Bone and Cartilage are the ſubjects of Fracture, which happens ſometimes on either ſide, ſometimes in the middle, chiefly by a Blow or Fall; this is eaſily to be diſtinguiſhed by the Sight or Touch. If either of the Bones in the front of the Noſe are fractured, it produces a Flatneſs in the Noſe, and the Air meets with obſtructions in its paſſages through the Noſtrils. If the Bone on either ſide is fractured, the Part becomes hollow: When the Cartilag

Cartilage is disturbed, the Nose inclines too much to one side; *See* Celsus *upon this head, Lib.* VIII. *Cap.* V. Sometimes the Fracture happens without a Wound, but is much oftener attended with a Wound of the common Integument. If the injury of the Nose is very violent, the Fracture cannot be so perfectly cured, but some deformity will still remain. The vicinity of this part to the Brain, which is frequently injured at the same time, renders cases of this kind frequently very dangerous. A *Caries* also, *Ozena* and *Polypus*, are no uncommon attendants upon this Disorder: By which means the sense of Smelling, the faculty of Speech, and the actions of Inspiration and Expiration, are very much disturbed.

After what manner Bones of the Nose are to be replaced.

III. In order to restore the fractured Bones of the Nose to their natural situation, the Patient is to be placed in a seat opposite to the Light, and his Head held back by an Assistant. The Surgeon is to raise the depressed Parts with a Spatula, Probe, or a Quill, applying externally the Thumb of one Hand, and the fore Finger of the other. If the Bones of the Nose are fractured on both sides, they are to be raised on each side after this manner, and the cavity of the Nostrils is to be filled up with long Dossils to prevent the Bones from collapsing; covering the part also, for this end, with some Plaster, having first applied such Dressings as are ordinarily used to recent Wounds. If the Bone is fractured into several Splinters, they are to be forced into their proper places by the Fingers; but if a Splinter is so entirely separated from the Bone that it will not easily unite with it again, you must remove it with your Forceps.

How the Bandage is to be performed.

IV. When the Fracture of this Part is accompanied with an external Wound, after you have replaced the Bones, you should dress the Wound (at first) with dry Lint, covering it with a vulnerary Plaster: Afterwards you must use balsamic Medicines, such as *Ung. Digestiv. Essent. Aloës, Myrrhæ, Succin. Mastich.* All greasy and oily Medicines are to be diligently avoided here, and in all other cases where the Bone is injured; because they are very hurtful in these cases. But where you have no external Wound, it will be sufficient to apply a sticking Plaster to the Part, to secure the Bones in their situation: And by this means you will find they will unite in about fourteen days; if no Abscess or *Caries* supervene. If the Bone should require a stronger support than what we have hitherto mentioned, you may make one of single or double Cap-Paper, which may be adapted to each side of the Nose, and supported with Bolsters. *See Plate* VIII. *Fig.* VIII. The whole must be supported with a Bandage of four Heads, which must not be bound on too tight; which will appear to you more clearly, when you consult what we shall say below, where we are to treat professedly of Bandages. Before the Plasters and Bandages are applied, some introduce a Silver or Leaden Pipe, or Quill, into each Nostril, to render the faculty of Breathing easier. *See Plate* II. *Let.* P *and* Q. In order to secure these Pipes and the Bones of the Nose in their proper situation, they use the four-headed Bandage. Some amongst the modern Surgeons entirely reject the use of all this Apparatus, except the Bolsters, Bandage and Plaster; for they are of opinion that it does more harm than good, and that the introduction of Pipes, or even Tents, into the Nostrils, will occasion so great a degree of Irritation, and such a difficulty of Breathing as is not to be borne; besides, when once the Bones of the Part are properly replaced, they are not so easily disturbed as is commonly imagined.

CHAP.

CHAP. IV.

Of a FRACTURE *of the Jaw.*

I. THE lower Jaw is not ſo liable to Fractures as the reſt of the Bones: Whenever this caſe happens, it is broke either on one ſide or on both; and the divided parts, in this caſe, do not recede any conſiderable diſtance from each other; for the Muſcles of this part are ſo ſituated, that the Bones are not much ſeparated from each other by their action. But the degree of injury depends upon the Violence of the Blow received. Of a Fracture of the Jaw.

II. That kind of Fracture in this part is ſooneſt diſcovered, where the Bones are ſeparated from each other. For not only the Sight, but eſpecially the Touch, will ſpeedily and evidently demonſtrate what is diſplaced in the Jaw, and whether the natural poſition of the Teeth be diſturbed. Beſides which, the Patient's ſuffering violent Pains, and ſometimes Convulſions, is uſually a pretty certain ſign that the Jaw is fractured; but if the Pieces of the Bone are not ſeparated, the Fracture is diſcovered with much more difficulty. By what ſigns a Fracture of the Jaw is known.

III. A Fracture of the Jaw being thus diſcovered, our next intention is to reſtore the broken Bone to its proper and natural poſition. The Patient is therefore to be commodiouſly ſeated againſt the Light, and his Head to be held firm by an Aſſiſtant. The Surgeon is then to introduce his Thumb or fore Finger of one Hand into his Mouth, applying his other Hand externally: And by this means he is to preſs the fragments of the Jaw on each ſide, till they have regained their former ſituation; which may be known by the regular diſpoſition of the Teeth. But if any of the Teeth be found looſe or ſlipp'd out, it may not be improper, if nothing hinders, to reſtore them afterwards to their places [a], and to faſten them by Gold or Silver Wire, or with Cerate, to ſuch as are next them; for by this means they have been frequently held firm. If the Jaw ſhould happen to be broken on both ſides, they muſt be reſtored one after the other by the ſame method as before; but then the operation is uſually more or leſs ſucceſsful in proportion to the Surgeon's Skill in the Anatomy of this Part. If there ſhould be a piece not moved out of its place, there will be no occaſion to reſtore it. How the Bones of the Jaw are to be ſet or replaced.

IV. After the Bones are properly reduced, they muſt be covered with, firſt, a Plaſter, and then a Compreſs, dipped in *Sp. Vini*, and applied internally; and another Compreſs ſew'd to a piece of Paſte-board in the form of a half Jaw, is to be laid on externally. *See Fig.* IX. *Tab.* VIII. Theſe are to be kept on by the Bandage with four Heads, perforated in the middle, to let in the Chin; or elſe it muſt be very carefully bound up with the particular Bandage for this caſe, which we ſhall deſcribe when we come to treat profeſſedly of Bandages. But whenever the Jaw is found to be fractured on both ſides, it is uſual to introduce and apply internally, after the Compreſs dipped in *Sp. Vini*, another made of thin Paſte-board, perforated in its middle, and accommodated to the figure of the Chin, as at *Fig.* X. In this manner its middle (*a*) that is perforated, is to be What is to be done after the Jaw Bone is ſet.

[a] *Goueus* indeed diſſwades us from this Method, thinking that the Bones will by this means be again diſplaced; but *Turner* (and ſome others) in his Surgery gives an inſtance where it ſucceeded, and ſo does *Le Dran, Obſ.* 3. *Tom.* I.

applied

applied to the Chin; and its two extremities (*b b*), toward the Ears. But Fractures of this part may be well enough cured without Plaſters and Splints, where we can commodiouſly apply a Bandage: For the Bones are not very eaſily diſplaced, when they are once reduced. In what manner this part is to be bound up, we ſhall make pretty evident, when we come to treat of Bandages in particular.

How the Patient ſhould behave himſelf under the Cure.

V. To forward the agglutination of the fractured Jaw, after Phlebotomy, the Patient ſhould be reconciled to reſt as much as poſſible; but above all he ſhould ſtrenuouſly avoid, particularly for the firſt days, all talk and eating. It ſeems therefore to be much the ſafeſt way to live upon, till the Jaw is grown firm, only fluid Aliments, ſuch as Broths and Soops, poach'd Eggs, Jellies and the like, taking care not to lie flat, either on the Back or Face: By which means the Fracture will be well in about twenty or thirty days; eſpecially if the internal parts of the Mouth that are injured, be frequently moiſtened with a little *Mel Roſarum*.

VI. If the Fracture be attended with a Wound, it muſt be undone every day, and treated as we have taught in *Chap.* IV. *N°.* VI. till it be healed. An example of a Fracture in both Jaws may be ſeen in *Le Dran, Obſ. Chirurg.* 3. *Tom.* I. but of a the lower Jaw only, in *Obſ.* 8.

CHAP. V.

Of a FRACTURE *of the Clavicles, Sternum and Humerus.*

Of a fractured Clavicle.

I. THE Clavicle [a] is extremely ſubject to be fractured, both from its tranſverſe poſition, and from its ſmallneſs; which then happens either in its middle, near the Humerus, or near the Sternum. But in whichever of theſe parts it happens to be broke, that end next the Humerus always deſcends lower than the other, next the Sternum; from the weight of the Arm, which was before ſuſtained by the Clavicle and head of the Sternum. And notwithſtanding that part of it next the Sternum remains immoveable, by the deſcent of its other end, it can ſcarce happen but they will in ſome meaſure collapſe one over the other.

How a Fracture of the Clavicle is to be diſcovered.

II. It is no great difficulty to know when this part is fractured: For (1) it will be hardly poſſible for the Patient to lift up his Arm; (2) his Arm will hang inclining towards his Breaſt, whereas before it was ſtraight, or tended rather backward; (3) and laſtly, as the Clavicles are covered with ſcarce any Muſcles, the Fracture will be greatly evident both to the Touch, the Eye, and the Ear; eſpecially upon any ſmall motion of the part.

The *Prognoſis* of a fractured Clavicle.

III. The reduction of a broken Clavicle is not very hard to be effected, eſpecially when the Fracture is tranſverſe: Nor is it uſual for the Humerus, with the fragment of the Clavicle, to be ſo far diſtorted as not to be eaſily replaced with the Fingers. But the difficulty is much greater to keep the Bone in its place, when the Fracture is once reduced, eſpecially if the Bone was broken

[a] A Fracture of the Clavicle is by *Celſus* (*Lib.* VIII. *Cap* VIII.) called *Jugulum fractum*; but all the modern Surgeons and Anatomiſts give the Name of *Clavicle* to this Bone, and attribute a quite different ſignification to the word *Jugulum*.

obliquely.

obliquely. For which there are two Reaſons: *viz.* the circular Bandages, with which the Bones of the Arms and other Extremities are uſually held very firm, cannot be applied here; by Reaſon of the Form and Diſorder of this Part: And then the Weight of the depending Arm itſelf, ſoon pulls aſunder what the Surgeon has been replacing. It is no Wonder therefore if the Juncture of the Clavicle be often found either uneven or unfirm after its Agglutination. Yet we do not want Examples where fractured Clavicles have been very happily and firmly cured, eſpecially when the Patient keeps himſelf quite free from Motion.

How the broken Clavicle is to be reduced.

IV. A Fracture of the Clavicle is to be reduced in the following Manner: The Patient muſt be placed on a low Seat, and an Aſſiſtant is to thruſt his Knee againſt the Middle of the Patient's Back, between his two Shoulders; then laying hold of the Heads of both the Patient's Arms with each Hand, he muſt pull them gently and gradually backwards; by which Means the Clavicles will be properly extended. Whilſt this is doing, the Surgeon ſhall ſtand before, and endeavour to replace the Bone with both his Hands, ordering the Aſſiſtant to hold the Bone in that Poſition. He is then (1) to apply the narrow and thick Compreſs (*Tab.* 9. *Fig.* 13.) folded up at each End, ſo as to fill up the Cavities above and below the Clavicle. Upon theſe (2) he is to lay two more narrow Compreſſes, made in the Form of an X. Over all theſe, he is (3) to apply a Piece of Paſte-board (*Tab.* 8. *Fig.* 12.) accommodated to the Shoulder and Neck, and firſt ſteep'd in *Sp. Vin.* or Oxycrate. Then he muſt (4) place a Ball under the Arm, or bind it ſeveral times with a thick Roller, to prevent the *Humerus* from ſubſiding. And laſtly (5) the whole is to be diſcreetly bound up, and the Arm ſuſpended in a Saſh or Sling, that is put about the Neck. The Plaſters that were uſed to be frequently applied in this Caſe, have been generally found to be uſeleſs.

V. As it is ſometimes very difficult to keep the Arms from puſhing inwards, which would diſturb the Agglutination; it will be of Service to uſe a Wooden or Iron Inſtrument (*Tab.* 8. *Fig.* 13.) in the Form of a T, uſed to keep back the Shoulders. The Sides of this Inſtrument are about the Breadth of three Fingers, and lined with Cloth or Leather. It is to be applied thus: *viz.* the two Arms AA are to be placed againſt each Shoulder, and the perpendicular Part B is to go againſt the Middle of the Back. Through the Aperture C is paſſed a Ligature to faſten it to the Body; the two Arms being firſt put through the Rings AA. The tighter the perpendicular Part B is faſtened to the Body, the more the Shoulders are by that Means drawn backward. But if they cannot be this Way drawn tight enough, a Compreſs, folded lengthways, is to be firſt placed between the Back and the Inſtrument; by which means the Shoulders will be drawn more ſtrongly backwards. The Rings AA may be made of Iron or Leather, ſo as to be taken in or let out, as there may be Occaſion.

What is to be done in caſe of looſe Splinters.

VI. Whenever there are any looſe Splinters of the Bone that are entirely ſeparated, which though they ſhould not wound and hurt the Fleſh, yet obſtruct the meeting of the Clavicle; it ſeems altogether requiſite to open the Skin and remove them, before the Reduction of the Bone, treating the Wound as uſual. But if there ſhould be any Splinters which ſtill adhere to the Bone, and prick the adjacent Parts, or impede the Reduction; they muſt be alſo either taken off with the *Forceps*, or elſe forced into their Places, whereby they may be again united to the Bone. But to divide the Parts, and remove the Fragments, requires

great Caution; leſt ſome of the large ſubclavian Veins or Arteries be wounded in the Operation, and a fatal Hæmorrhage be thereby produced.

Of a Fracture of the *Scapula.*

VII. The *Scapula* is uſually fractured either near its *Acromion* or Head, where it joins with the Clavicle, or in ſome other Part. If in its *proceſſus Acromion*, the Reduction may be eaſily made by lifting up the Arm to relax the Deltoide Muſcle, and by puſhing the Arm evenly upwards, making the fractured Parts meet together by the Fingers; but then they eaſily ſlip away again by any ſlight Cauſe, and ſo are difficultly agglutinated: More eſpecially, they are eaſily ſeparated by the Weight and Motion of the Arm, and the Contraction of the Deltoide Muſcle. Inſomuch that there is ſcarce any Body that ever cures a fractured *Acromion* ſo as to admit afterwards of a free Motion of the Arm upwards [a]. In the mean time all Means muſt be uſed to retain the replaced Bones in their right Situation; a Compreſs wet with *Sp. Vin.* is to be applied to the Fracture, a Ball is to be put under the Arm-pit to ſupport it, the whole is to be bound up with the Bandage commonly called *Spica*, and the Arm is to be ſuſpended in a Saſh or Sling, hung about the Neck. But if the Neck of the *Scapula*, which lies under the *Acromion*, or its *Acetabulum* ſhould be fractured, which is a Caſe that as ſeldom happens as it is difficult to diſcover, by reaſon of its thick Covering; it is a hundred to one but from the Vicinity of the Articulation, the Tendons, Muſcles, Ligaments, Nerves, and large Veins and Arteries, there will follow a Stiffneſs and Loſs of Motion in the Joint, great Inflammation and Abſceſs with the worſt of Symptoms, and Death itſelf; as happened in a Caſe I ſaw, of a certain Profeſſor at *Helmſtadt* [b]. But when the Fracture happens in ſome other Part of the *Scapula*, the Symptoms are generally much milder.

How the fractured *Scapula* is to be reduced.

VIII. That the fractured *Scapula* may be ſet with the greater Readineſs, an Aſſiſtant is to extend the Arm gently forwards, the Surgeon in the mean time dexterouſly replacing the Fracture with his Hands, is to apply afterwards the proper Compreſſes, and Slips of Paſte-board, ſuitable to the *Scapula*, and firſt wet with *Sp. Vin.* or Oxycrate; which are then to be firmly bound on with the *Stellate* or four-headed Bandage, as we ſhall direct at large in the third and laſt Part of this Treatiſe.

Fracture of the Sternum.

Of a fractured *Sternum.*

IX. The *Sternum* is equally ſubject to Depreſſions and Fracture, from Falls or Blows, with the reſt of the Bones. When either of theſe happen, the Part is not only uneven and painful, but the ſubjacent Arteries and Veins are alſo contuſed or ruptured; whence ariſe Pains in the Breaſt, Difficulty of Breathing, violent Coughs, Spitting of Blood, or elſe Extravaſations of it in the *Præcordia*, or between the Duplicature of the *Mediaſtinum*, with many bad Symptoms of the like Nature.

The Signs of a fractured *Sternum.*

X. The Signs therefore of a fractured *Sternum*, will be in my Opinion ſufficiently evident from what follows. Namely its Depreſſion or Fracture will appear not only from the Symptoms before mentioned (*N°.* IX.), but frequently alſo from the *Sternum*'s being unequal or moveable to the Touch; eſpecially when one Part grates againſt the other. The Depreſſion of the *Sternum* will be alſo apparent not only from the Symptoms of the preceding Section, but alſo from

[a] Such is the Opinion of CHESELDEN, treating of this Bone, in his Anatomy.

[b] The ſame has been obſerved by CHESELDEN (loc. citat.) and by DOUGLASS.

the

the Cavity or Inequality made in this Part, which is a Sign peculiar to this Diſorder.

How the *Sternum* is to be replaced.

XI. In order to ſet the Fracture, if any Part of the Breaſt-bone be diſplaced, it will be very ſerviceable to lay the Patient on his Back, upon a Bed or rather a Table, putting a hard Pillow, a large Piece of Cloth rolled up, a Drum or other Cylinder under his Back, preſſing down his Shoulders; by which means the *Sternum* will be elevated and extended. And to facilitate the Reduction, the Surgeon muſt preſs the Sides of the Breaſt together, and ſhake them pretty ſtrongly. But when this Method is impracticable or not proper, the Skin muſt be divided, and the depreſſed Part of the *Sternum* lifted up into its Place, by means of a Lever, commonly called an Elevator; or elſe by a Screw, gently wormed into the Part, and pulled upwards. Notwithſtanding this Way of Cure is more operoſe and difficult than the former, it is preferred by Goury (*in Chirurgie veritable*) and Petit (*de Morb. Oſſ.*) as the beſt and readieſt Method. As for the fitteſt Method of retaining the *Sternum* after its Reduction, we ſhall treat that more at large, when we come to the Doctrine of Bandages. But if, as it ſometimes happens after the Reduction, violent Pains continue under the *Sternum*, and if Blood ſhould gather and ſuppurate internally between the Duplicature of the *Mediaſtinum*, it will not be improper to trepan the lower Part of the *Sternum* (as Petit adviſes) after the manner we do the *Cranium*; and when the putrid Matter is diſcharged, and the Cavity cleanſed, it ſhould be carefully treated with ſome vulnerary Balſam. Laſtly, If any Blood ſhould be found extravaſated in the Cavities of the *Thorax*, the Cure ſeems to depend entirely upon diſcharging this by the *Paracenteſis*, in the manner we have deſcribed under Wounds of the *Thorax*. As to the Buſineſs of Dreſſing, after the Application of Compreſſes dipp'd in warm *Sp. Vin.* we muſt go on with that kind of Bandage called the *Napkin-and-Scapulary*.

CHAP. VI.

Of Fractures *in the Ribs*, Vertebræ, Os ſacrum *and* innominatum.

Of fractured Ribs.

I. SOMETIMES the Ribs are fractured or only fiſſured, in ſuch a manner that barely ſome external and internal Part of them are hurt, and not moved out of the natural Places; which Caſe is uſually attended with no bad Symptoms, and is often ſcarce diſcoverable, the Bone growing together again of itſelf. But if the whole Rib be fractured, and ſome Part of it moved out of its Place, it is a more dangerous Caſe: For the coſtal Muſcles, and the *Pleura* that lines the internal Cavity of the *Thorax*, will be very much diſturbed by the ſeparated Fragments of the Bone. When a Rib is fractured, it projects either externally or internally, much in the ſame manner as if it was a broken Arch; when it projects externally, the Symptoms are uſually much the milder[a]; but when it is drove inwards, the Caſe is much worſe, eſpecially if any Vein or Artery be divided ſo as to let Blood run into the *Thorax*. In Conſequence of which, we need not wonder if violent Prickings, Inflammation, difficult Reſpiration,

[a] Indeed Goury denies that broken Ribs are ever drove outwards; but Petit (*lib. de Morb. Oſſ.*) witneſſes that there may be ſuch a kind of Fracture.

Cough, Fever, Spitting of Blood, Suppuration, Extravaſation of Blood in the *Thorax*, or cellular Interſtice of the *Mediaſtinum*, and other bad Symptoms ſhould follow in courſe; eſpecially if the neighbouring *Viſcera* be wounded at the ſame Time. If theſe be not timely remedied, they produce violent Fevers, Inflammation and Ulceration of the Breaſt and Lungs, *Empyemata*, incurable *Fiſtulæ* and *Caries* of the Bones, and ſometimes Death itſelf will be the End. It frequently happens, unleſs the Fracture be a ſimple one, that the ſoft Parts are punctured, and an external Wound made, by ſome ſharp Piece of the Bone. If the Parts are wounded, it occaſions ſometimes a very profuſe Hæmorrhage, often very difficult to ſtop; and if the Blood ſhould run into the *Thorax*, it can ſcarce be diſcharged from thence but by the *Paracenteſis*, or elſe by dilating the Wound, when it happens between the baſtard Ribs. If by any external Force the Cartilages ſhould be ſeparated from the Ribs, we term it a Fracture, and treat it in the ſame Method with other Fractures in this Part, which we are going to deſcribe.

The Method of diſcovering a Fracture of the Ribs.

II. When the fractured Parts of a Rib keep in their natural Situation, and are therefore unaccompanied with any conſiderable Pain, it is difficult to diſcover the Fracture; but yet, upon ſlightly moving the ſame, it will be attended with ſome Pain, though it will the more readily grow together. But when the fractured Parts recede from each other, the Deformity will be apparent both to the Eye and Touch, and a Noiſe will be heard upon moving them. If a ſharp Piece of the Bone ſhould moleſt the *Viſcera* internally, it will occaſion the greater Part of the Symptoms mentioned at *N°*. I. and from the Intenſity and Malignity of thoſe, we judge the Fracture to be more or leſs dangerous. But it alſo frequently happens, that a Fracture of the Ribs occaſions a windy Tumor, called by the Greeks *Emphyſema*; formed by the Air inſinuating itſelf, by a ſmall Wound, between the Skin and Muſcles, into the Subſtance of the cellular or adipoſe Membrane; ſpreading itſelf afterwards up to the Neck, Head, Belly and other Parts, much after the manner in which Butchers blow up their Veal.

How a ſlight Fracture of the Ribs is to be ſet.

III. In order to replace fractured Ribs, it is always previouſly neceſſary to enquire whether the Splinters project externally or internally. When the firſt is the Caſe, the Patient is to be placed on a high Table, and the ſeparated Bones muſt be gently forced by the Fingers into their Places, the proper Compreſſes dipped in *Spir. Vin.* muſt be laid on, and then covered with Slips of Paſte-board or Splints; and laſtly, the circular Bandage, or elſe the *Napkin-and-Scapulary*. But when the latter is the Caſe, while the Patient retains a deep Breath, the Surgeon carefully compreſſes both Sides of the Rib with his Hands, agitating till they are properly fixed. What is farther neceſſary to be done in this Caſe, will come under the Head of Bandage; unleſs that the Paſte-board is to be here omitted, and the Napkin not drawn very tight; but the Dreſſing need not be undone, unleſs it be over looſe, and ſome Symptoms or the Patient's erect Poſture require it. By theſe means, Fractures of this kind are uſually cured in about three or four Weeks Time. Through the whole Courſe of the Cure, as CELSUS (*Lib.* 8. *Cap.* 9.) adviſes, the Patient muſt carefully avoid all Talk and Clamor, Paſſions and Anger, violent Motions of the Body, Smoke, Duſt and every Thing that will occaſion Sneezing or Coughing. But if the Reduction cannot be effected by the means hitherto delivered, it may be not improper to try by ſome

ſticking Plaſter, as in a Depreſſion of the *Cranium* at *Book* I. *Chap.* XIV. *N°.* 24.

IV. If any ſharp Pieces of the Ribs ſhould pierce the *Pleura*, it will occaſion moſt violent Pains, a Difficulty of Breathing, a Cough, Spitting of Blood, Inflammation, Fever, and other ſuch grievous Symptoms; therefore it will be proper to open the Skin and extract the Fragments which ſtick in the Fleſh with the Fingers, Plyers, Hooks, or other proper Inſtruments. Unleſs this Method be followed, the Patient will be in great Danger; to prevent which, Phlebotomy, Glyſters, cooling and Anodyne Medicines are to be uſed, and a thin Diet muſt be followed. This Method of Inciſion is alſo more particularly neceſſary when the ſticking Plaſter, and other Means adviſed, prove inſufficient to reduce the Fracture. What is to be done in the more dangerous Fractures of the Ribs.

V. When there happens to be a Wound of any of the Veins or Arteries which run under the Ribs, ſo as to let their Blood flow internally, the Caſe will be much the ſame with the Wounds mentioned in *Book* I. *Ch.* X. and it ſeems then neceſſary to open the *Thorax* near the fractured Part, ſufficient to admit the Finger, anointed with ſome Liniment and dipped in ſome ſtyptick Medicine, which is to be held upon the Veſſels till the Blood ſtops. But when the Finger proves ineffectual, the divided Veſſel muſt be diſcovered, and cloſed either with a Ligature or an actual Cautery, properly applied. And in order to diſcharge what is lodged in the *Thorax*, when the Wound itſelf is in the lower Part thereof, the Surgeon muſt dilate and keep it open with Lint; but when the Height of its Situation in the Breaſt, will not admit of a convenient Diſcharge by that, a freſh and more convenient Opening or *Paracenteſis* muſt be made in the lower Part of the *Thorax*. *See Book* I. *Chap.* X. *N°.* 10. Of the Veins and Arteries hurt.

VI. When an *Emphyſema* happens, it will be very proper to enlarge the Opening in the Skin, when too narrow, with the Scalpel; and to bring down the Tumor with Frictions and Bandage, carrying the Compreſſion gradually towards the Opening, ſo as to expel the included Air by degrees. But if there ſhould be a Contuſion alſo, it muſt be treated in the Method which we have already laid down in the Chapter (XV. *Book* I.) of Contuſions. If a violent Cough and Suppuration follow, it muſt be remedied by Bleeding, and other proper Medicines. See an Example in LE DRAN, *Obſ.* 29. *Tom.* I. How the *Emphyſema* and Contuſion are to be treated.

VII. When any of the *Vertebræ* are fractured, either by Fall, Blow or any other Cauſe, without hurting the ſpinal Marrow; we may reaſonably ſuppoſe that the Fracture is confined to ſome of the oblique or ſpinal Proceſſes; and therefore the Patient will be in no great Danger. But when the Body of the *Vertebræ* is either broke or ſplit by ſome external Force [a], and the contiguous ſpinal Marrow bruiſed or compreſſed; all Parts of the Limbs and *Viſcera* beneath that *Vertebra* become immoveable and rigid. No Wonder then, if a ſpeedy or ſlow paced Death often follows, in Proportion to the Degree of Damage. Here it may be alſo proper to recall to Mind, what has been ſaid in the preceding Book, on Wounds of the *Medulla Spinalis*. And laſtly, if the tranſverſe Proceſſes of the *Vertebræ* are broke, which incline towards the Cavity of the *Thorax*, it is Fractures of the *Vertebræ*.

[a] GOUEY thinks the Body of the *Vertebræ* cannot be fractured, unleſs by a Bullet: But I have ſeen them from a violent Fall, off a high Place, and the Patient died ſoon after, as they generally do in this Caſe.

ſcarce

ſcarce poſſible that the Heads of the Ribs which are there connected, ſhould eſcape being fractured alſo; which makes the Caſe very deplorable.

The Signs of Fractures in the *Vertebræ*.

VIII. Fractures in the *Vertebræ* may be judged to be preſent from (1) conſidering the Nature of the external Violence, whether it be a great Fall, Blow or the like; but more eſpecially (2) from the Pains ſeated about the affected *Vertebra*; and laſtly (3) from the Manifeſtation thereof to the Touch, Eye and Ear.

How to replace the fractured Proceſſes or *Apophyſes*.

IX. When only the Proceſſes of the *Vertebræ* are found broken, it will be much the beſt Way to force them into their Places with the Fingers, placing narrow Compreſſes dipped in warm Spirit of Wine on each Side the *Vertebræ*, and over them, Slips of thick Paſte-board, to be kept on by the *Napkin-and-Scapulary*. For by this means the Bones of the *Vertebræ*, which are very ſoft and ſpongy, will quickly and eaſily grow together again.

How the worſt Kind of Fractures in the *Vertebræ* are to be treated.

X. If in any Caſe the Spinal Marrow ſhould be divided, Death will be generally an inevitable Conſequence. But to offer the Patient no Aſſiſtance, becauſe we deſpair, would ſeem cruel and uncharitable, therefore we muſt try our Skill, though our Attempt ſhould be in vain; in order to which, the Surgeon muſt lay bare the fractured *Vertebra* with a Scalpel, and replace or elſe remove ſuch Fragments as injured the Spinal Marrow. The Wound is to be afterwards gently cleanſed as uſual, and dreſſed with the Balſams mentioned *Book* I. *Chap.* II. *N°.* 15. to be held on with the *Napkin-and-Scapulary*, till the Wound ſhall terminate either in a perfect Cure or Death.

Fracture of the *Os Sacrum*.

XI. It ſometimes alſo happens that, by a Fall or a Blow, the *Os Sacrum* becomes in like manner fractured. Which may be diſcerned to be broken, from conſidering the external Violence, the Pains, by the Touch, *&c.* as is uſual in other Fractures.

How to ſet a Fracture of the *Os Sacrum*.

XII. As ſoon therefore as the *Os Sacrum* is found to be fractured, its Fragments are to be forced into their Places with the Fingers. But if any Part of it be depreſſed inwards, it may be convenient to introduce a Finger (that has firſt had its Nail cut cloſe, and been dipped in Oil or Butter) up the *Anus*, in order to thruſt the depreſſed Fragment into its proper Place, to which it is to be directed externally by the other Hand. This being performed, we muſt apply ſome Plaſter ſuitable for Fractures, with Compreſſes dipped in *Sp. Vin.* over it, to be kept on by the T Bandage; or the Plaſter may be omitted, and only the Compreſs and Bandage retained. And laſtly, to facilitate the Agglutination, the Patient ſhould keep his Bed quietly on his Sides for about a Fortnight; or if he muſt needs ſit at times, let it be in a Chair without a Bottom, to avoid diſplacing of the Bone, from touching the Seat.

How the *Os Innominatum* is to be replaced.

XIII. When the *Os Innominatum* is broke, which ſeldom happens, it is readily diſcovered by the Injury and Symptoms in the neighbouring Parts; and is more particularly dangerous when the Patient diſcharges a brown and bloody Matter. In reſtoring this Bone, the Patient muſt lay down on his ſound Side, the Bone is to be replaced with the Hands, covered with Compreſſes, dipped in *Sp. Vin.* and bound up with the Bandage *Spica*. Afterwards Bleeding with cooling and relaxing Medicines muſt be uſed, and a thin Diet obſerved.

CHAP. VII.

CHAP. VII.

Of FRACTURES *in the Bones of the* Humerus, Cubitus *and Hands.*

Fracture of the *Humerus* or Fore-Arm.

I. THE *Os Humeri* is broke either in its Middle, which is the leaſt dangerous; or elſe near its upper or lower Head, which is much worſe, as being more difficult to cure, and producing more violent Symptoms. Indeed Fractures of this Part are uſually very obvious to the Senſes, being expoſed to the Eyes and Hands; but then they require a different Treatment, according to the particular Part injured. It ſometimes alſo happens that the fractured Parts of this Bone keep their Places; but it more frequently falls out that they ſlip one over the other, by which means the fractured Limb becomes ſhorter than the ſound one. But it will ſometimes, though ſeldom, happen that the two Parts of the Bone ſhall recede much from each other; by reaſon of the Weight of the Arm, which they ſuſtain. If the firſt be the Caſe, the Fragments are uſually more eaſily and readily replaced; but in the latter, there are required more Force and Skill to reduce the Bones to their Places, from whence they were removed; eſpecially if the Patient has tenſe Nerves and large Muſcles, as is uſually obſerved in ſtrong Men.

How a broken Arm is to be ſet.

II. In a Fracture of the *Os Humeri*, the Arm may be readily extended in the following manner: Let the Patient be ſeated on a high Stool, and an Aſſiſtant lay firm hold of his Arm, above the Fracture, keeping his Elbow gently bended; then the lower Part of the Arm, beneath the Fracture, is in like manner to be taken hold of, and the Arm is to be gently extended forward, by endeavouring to remove eaſily each Part from the other in a right Line. Then the Surgeon himſelf lays hold of the fractured Part of the Arm, with both his Hands, and ſtrives to replace the Bones, held in a due Extenſion by the Aſſiſtant, into their proper Situations; judiciouſly rolling up the Part with proper Bandages, agreeable to what has been ſaid of them in general in the Introduction, and what we ſhall explain more at large in the particular Doctrine of Bandages alone. If one Aſſiſtant be not able ſufficiently to extend the Arm of a robuſt Patient, the Office may be undertaken by two; or elſe thin Napkins or other Linen Bandages may be wound round each Articulation of the Arm, and given to ſeveral Aſſiſtants, to be pulled in oppoſite Directions, till the Limb be ſtretched a little longer than it naturally ought, and then the Surgeon is to replace the Bones.

Of Fractures in the *Cubitus*, or Lower-Arm.

III. The lower Part of the Arm, called by Anatomiſts *Cubitus*, contains two Bones; the *Radius*, and the *Ulna*. A Fracture in this Part may therefore happen to only one, or to both of theſe Bones; and that either in their Middle or Extremities. But when they are both broke together, the Bones are not only very eaſily diſtorted from each other, but are alſo replaced and joined together again with much more Difficulty. But if one only ſhould be broke whilſt the other remains whole, the fractured Parts do not much recede out of their Places, nor are they very difficult to reduce and retain. For the ſound Bone is found to be a better Direction and Support in this Caſe, than either Splints or Bandages. When the Fracture happens towards the lower Head, near the *Pronator quadratus* Muſcle, the fractured Part is ſtrongly drawn (by that Muſcle, and the inter-

intervening Ligament that is ſpread between the *Radius* and *Ulna*) towards the ſound Bone, which makes it more difficult to replace. This is therefore a very material Circumſtance to be conſidered in the *Prognoſis* and Cure of this Fracture.

The Signs of a Fracture in the *Cubitus*.

IV. A Fracture in theſe Bones of the Arm may be well enough diſcovered by the Signs common to Fractures in general: But whether one or both be broke, and which of them is the Bone and its particular Part fractured; theſe may be known by the Sight and Touch, and by properly moving the Joint in or out, as may be neceſſary. It is however much eaſier to diſcover a Fracture in the *Ulna*, from its Inability to ſupport the Joint as uſual, than that of the *Radius*. The Ear will alſo frequently aſſiſt the Sight, in the Search after this Fracture; for there will be generally perceived a Grating of the Bones, upon moving the Patient's Hand in and out, whilſt the Upper part of the *Cubitus* is held firm.

In what Manner the *Radius* is to be ſet.

V. If the *Radius* is to be ſet or replaced, whoſe Fragment is contracted towards the *Ulna*, an Aſſiſtant muſt hold the Arm whilſt the Surgeon inclines the Patient's Hand towards the *Ulna*, to draw back the contracted Part of the *Radius*. When this is done, he muſt carefully reduce them by Compreſſion on each Side with the Palms of both his Hands, ſo as to reſtore the compreſſed Muſcle, between the *Radius* and *Ulna*, and Fragments of the *Radius* to their proper Places. The Arm is to be then bound up in the Method we ſhall hereafter deliver. And the Limb is to be put into a ſort of Caſe (*Tab.* 8. *Fig.* 14.) made of Paſte-board or light Wood, to be ſuſpended in a Sling put about the Neck.

How the *Ulna* is to be replaced.

VI. In ſetting a Fracture of the *Ulna*, the ſame Method is to be obſerved with that of reducing the *Radius* as before, binding and ſuſpending it in the ſame manner; but there is this Difference neceſſary to be obſerved, that in the Extenſion the Hand muſt be bent towards the Thumb and *Radius*, before the diſtorted Part of the *Ulna* can be compreſſed into its Place.

How we are to treat a Fracture of both the Bones.

VII. When both Bones of the *Cubitus* are broke, the Method of Cure will be much the ſame with that uſed to each of the Bones, when broke ſingly; unleſs that there is required more Strength and Circumſpection in replacing and retaining them, and the Bandage muſt be applied with greater Caution. We muſt be alſo careful to obſerve, that, while the Arm continues a good while without Motion, the Mucilage of the Joint does not harden, or the Ligament become ſtiff, and the Arm or *Cubitus* be thereby rendered immoveable. It will be therefore not improper to unbind the Part every other or third Day, and to move it carefully and gently, a little backward and forward, and ſometimes to foment it with warm Oil or Water; for, by this means, its natural Motion will be eaſily preſerved.

Fracture of the Wriſt.

VIII. The Bones of the Wriſt are ſeldom the Subject of Fracture, on account of their Smallneſs; but it ſometimes happens to them, from the Stroke or Compreſſure of ſome hard or heavy Body. When this is the Caſe, there uſually remain but little Hopes of effecting a Cure. For the Ligaments and Tendons are here ſo numerous, and the Bones themſelves are ſo very ſmall, that it ſeems ſcarce poſſible to reduce them into their Places, or make them grow together again. And, on this Account, the Joint of the Hand generally becomes ſtiff and immoveable; or elſe Abſceſſes, Suppurations, *Fiſtulæ* and *Caries* of the Bones do thence ariſe: Which, on account of the Softneſs of the Bones, and the Difficulty of diſcharging the Matter, are ſeldom remedied but by amputating the Hand.

Agreeable with this, Ruysch (*Obſ. Anat. Chirurg. pag.* 10.) among others, inſtances a Fracture of this kind, which after three Years Treatment, remained ſtill uncured.

IX. But that the Surgeon may not ſeem to be altogether negligent on his Part, he is rather to try what he can do in the Caſe, than to leave the Patient deſtitute of Help. It will be therefore moſt proper for an Aſſiſtant to lay hold of the Hand, and Arm above the fractured Wriſt, and to extend them as much as is ſufficient, in oppoſite Directions. While this is doing, the Surgeon muſt uſe all his Endeavours to reſtore the Fragments to their proper Places, with his Hands; and after he has very curiouſly reduced the Fracture, it is to be bound up with a ſuitable Bandage. How a Fracture of the Wriſt is to be treated.

X. As the *Metacarpus* is much more ſubject to Fractures than the Wriſt, becauſe its Bones are larger; upon the ſame Account it is alſo more eaſily replaced and cured. There can be hardly a better Method of reducing this Fracture, than that of ſpreading the Hand upon a ſmooth Table by an Aſſiſtant, the Surgeon carefully uſing all his Endeavours to replace the Bones with his Fingers, ſecuring them with a proper Bandage. An Inſtance of a Fracture in the Wriſt with a Wound may be ſeen in Le Dran's *Obſ.* 56. *Tom.* I. Fracture of the Hand, or *Metacarpus.*

XI. When one or more of the Bones in the Fingers are broke, the Surgeon's principal Buſineſs is to carefully replace what has been removed, and to roll up the Finger a little Way with a narrow Bandage, and then to bind it firmly to the next ſound Finger. The Method of commodiouſly applying the Bandage when ſeveral of the Fingers are broke at once, will be declared hereafter in the Doctrine of Bandages. But when the Hand or a Finger is ſo violently maſh'd as to have no Room to expect a Cure, it is more adviſeable to cut it entirely off than to conſtantly torment the Patient, and perhaps put him in Danger of his Life. Fractures of the Fingers.

CHAP. VIII.

Of a fractured Thigh.

I. THE Thigh-bone, though the largeſt and ſtouteſt in the whole Body, is frequently broke after ſeveral different manners; and that either in its Middle, or towards its Heads and Articulations: But more frequently near that Part which Anatomiſts call its Neck, near its Articulation with the Hip-Bone. Which, whenever it happens, is very difficult to ſet, and more difficult to retain in its Place. When the Bone is broke in two Places at once, the Danger is ſtill greater; and if the Patient ſhould eſcape Death, which they uſually do not, it is a common Caſe for him to be ever afterwards lame. Sometimes the Bone is broke tranſverſly, ſometimes obliquely, and at other Times the Ends ſlip one over the other, which makes it a very bad Caſe. For the Muſcles of this Part being very robuſt and ſtrongly contracted, draw the lower End of the Bone with a conſiderable Force upward, ſo as to make it require a conſiderable Strength to extend and replace it. The oblique Fracture more frequently ſlips out of its Place again than the Tranſverſe, and generally leaves the Thigh ſomewhat ſhorter than the other, notwithſtanding the Surgeon has performed his Duty with Exactneſs. It is therefore neceſſary to uſe in theſe Caſes, beſides the Means Fracture of the Thighs.

to be hereafter mentioned, a more ſtrict Bandage, than in the tranſverſe Fracture, to prevent the replaced Bones from being eaſily moved.

How a Fracture of the Thigh is to be ſet.

II. In reducing a fractured Thigh, we are to conſider whether the Bone be broke near its Neck, or in ſome other Part: Which Conſideration is always very neceſſary for the better replacing and binding up the Limb. Whenever then, a Fracture of the Thigh-bone happens either in the Middle or towards its lower Head, it is to be extended and replaced with the Hands like other Fractures; excepting that the extending Force here required, eſpecially in robuſt Patients, muſt be much greater. Therefore more and ſtronger Aſſiſtants are to be here employed, who are ſufficiently to extend the Limb with their Hands; or, where their Hands will not ſuffice, Slings, Napkins or linen Bandages may be bound round each Head of the Thigh, whereby the fractured Bone may be extended both Ways, while the Surgeon cautiouſly reduces the Fracture with his Hands, and treats it with a proper Dreſſing.

The Girt or Belt of Hildanus.

III. But when the Extenſion cannot be performed effectually by the Hands, Slings, nor Bandages, which is a Caſe that ſeldom happens, we muſt then have Recourſe to the Belt or Girt of Hildanus, *Tab.* 8. *Fig.* 17. which is to be drawn and buckled very tight above the Knee, being firſt introduced through the Eyes of the Hooks AA, upon which is to be faſtened a ſtrong and ſmall Rope BB, about the Middle C whereof are to be applied the Hands of the Aſſiſtants, or Napkins, *&c.* by which means a ſufficient Extenſion may be made, in order to replace the Fragments in their former Situations. Nor is this Contrivance reſtrained to the lower Limbs only; for it may be applied upon Occaſion, to extend Fractures of the *Humerus* and *Cubitus*. If a fractured *Cubitus* is to be extended, the Girt is to be faſtened above the Hand; if the *Humerus*, above the Elbow.

Of the compound Pulley, or *Polyſpaſton.*

IV. If the laſt Method of Extenſion ſhall prove ineffectual by itſelf, it ſeems every Way neceſſary to try if any thing can be done more to the Purpoſe by the Pulleys of *Tab.* 8. *Fig.* 18. The Hook A, of one Pulley, is to be faſtened upon the Rope of *Fig.* 17. at its Part C; the Hook of the other Pulley B, is to be hung upon the Ring A, of the Hand-ſcrew B, of *Fig.* 16; which is to be firſt ſcrewed tight into ſome Beam or Rafter. Then, the Patient being held firm, about the other Head of the fractured Limb, by means of Slings, Napkins or other ſtrong and long linen Bandages, to prevent his giving Way to the Extenſion; the Rope C, put through the Pulleys D, and E, of *Fig.* 18. muſt now be drawn through till the Thigh-bone be ſufficiently extended, ſo as to admit of a convenient Reduction thereof by the Surgeon. Here it is to be obſerved, that the more Wheels the Rope paſſes round in the Pulleys D, and E, of *Fig.* 18. the more eaſily and gradually will the Extenſion be performed, inſomuch that by this Inſtrument one Man may draw more than ten without it.

A Fracture in the Neck of the Thigh-bone.

V. When the Neck itſelf of the Thigh-bone is broke, to which, from its oblique or tranſverſe Direction and ſpongy or brittle Subſtance, it is very ſubject; it makes a Fracture not only very difficult to reduce, but ſuch a one alſo as can be ſeldom cured without leaving the Limb lame or ſhorter than the other, as Hildanus (*Cent.* 5. *Obſ.* 86.) and others teſtify. Now the Reaſons for this Calamity are more than one: For (1.) the Fragments cannot, but with great Difficulty, be preſſed into their right Places by Reaſon of the great Thickneſs and Strength of the Muſcles which cover them. (2.) It ſeldom happens that the Bones can be retained in their natural Poſition, after they have been very well

ſet;

ſet; becauſe the Muſcles which paſs over, and are inſerted a little below the Neck of this Bone, draw its lower Part upwards: And both theſe generally happen the more eaſily (3.) becauſe of the oblique Poſition of the Neck of this Bone, which is inſerted into its Head in a Direction not perpendicular nor parallel but as it were ſloping on one Side of the ſame; as will evidently appear upon viewing this Bone in a Skeleton. So that we have hence none of us any Occaſion to wonder, if Lameneſs and other bad Accidents follow as Conſequences of this kind of Fracture.

The Difficulty of diſcovering a Fracture in the Neck of the Thigh-bone.

VI. To the foregoing Reaſons we may add, (4.) That it is very difficult to diſcover when the Neck of the Thigh-bone is fractured, the Caſe being almoſt always taken for the Head of the ſame Bone being ſlipped out of its *Acetabulum* or Socket; till firſt PAREY (*Lib.* 14. *Cap.* 21.) then SCHENCKIUS (*Obſ.* 11. *Lib.* 5.) after them the celebrated RUYSCH [a] (when the Obſervations of the two former were forgot,) and, ſince him, ſeveral other eminent Surgeons and Phyſicians [b] have made it very evident, that the ſpongy Neck of the Thigh-bone is and may be oftener broke in two, than its Head, defended by very ſtrong Ligaments, be puſhed out of its deep Socket by any external Violence. Of this conſiderable Obſervation, the Phyſicians and Surgeons of not only former, but even the laſt Age, were ſo generally ignorant, that they never in the leaſt ſuſpected the Caſe to be a Fracture, but treated the Patient as if the Thigh had been luxated, tormenting and miſerably diſtorting the Member with the Machines uſed in that Caſe.

How this kind of Fracture is to be diſcovered and cured.

VII. When we think the external Force to have been ſufficient to produce a Fracture, when the Patient cannot bear any Streſs upon the Limb by ſetting his Foot to the Ground, when very acute Pains are felt about the Articulation itſelf; and when we find the affected Limb ſhorter than the ſound one, it being an eaſy Matter to turn the Foot almoſt round from one Side to the other, and perceive any cracking or grating of the Bones in that Motion, we may then reaſonably ſuppoſe that the Neck of the Thigh-bone is fractured. We muſt then carefully avoid the violent Extenſion of the Limb, which was uſed formerly under the Notion of a Luxation, by the Inſtruments contrived by SCULTETUS, and others, for that Purpoſe. Our Buſineſs here, is to extend the Limb very gently and gradually, till the diſordered Limb be of the ſame Length with the ſound one; and this by means of a Napkin, proper Slings, or the Hands of a ſtout Aſſiſtant faſtened round the Foot, or elſe by the preceding Girt and Pulley; in a manner by which we may be able to rejoin, in ſome meaſure, if not perfectly, the Neck of the Thigh-bone with its Head ſtill firmly adhering in its Socket. And though a Shortneſs of the Limb, or Lameneſs is generally left behind after this Fracture; yet becauſe there are ſome cured without thoſe Attendants, I muſt approve as very uſeful ſuch a ſtrict Bandage as may apply and retain the Neck to the Head of the Bone, ſo as that they may gradually grow together again. For which Purpoſe, we uſually apply the Bandage called *Spica Inguinalis*, in this Caſe; then a large and broad linen Cloth or Napkin is placed between the Thighs, to keep the Body of it from ſubſiding; and laſtly, Ligatures are put about the Knee

[a] In Theſaur. Anat. VIII. *Tab.* 3. *Fig.* 1. and Theſ. IX. *Tab.* 1. *Fig.* 1.

[b] CHESELDEN, Anatom. upon the Bones of the lower Extremities, and in *Tab.* VI. G. H. DOUGLAS, Philoſoph. Tranſact. *N°* 381. Ann. 1716. and PETIT, on Diſeaſes of the Bones. SALTZMAN. Diſſert. de Fractura Femoris frequentiori: and others.

and Ancle, whereby the Foot is faſtened to the lower End of the Bed, with a little Pad of Straw, to prevent the Limb from being contracted upwards: But we ſhall deſcribe all this more at large, when we come to the Doctrine of Bandages: Indeed PETIT teaches, that this kind of Fracture is to be bound up ſimply in the ſame Method with other Fractures of the Thigh; but that this is not reaſonable, the Experienced herein will readily allow. Having proceeded thus far regularly, and placed the Patient in as convenient a Poſture as poſſible, we muſt all along obſerve with a ſtrict Eye, whether the afflicted Member be either equal or ſhorter than the ſound one. If it ſhould be found to become ſhorter, there will be great Room to ſuſpect that the Neck of the Thigh bone is ſlip'd out of its Place again; and therefore it muſt be gently extended again, after unbinding it, till it becomes of the ſame Length with the ſound one as before. But when the Foot of this continues of the ſound Length with that of the ſame Limb, there is great Room to hope that the Patient will be happily cured; if a proper Diet be regularly obſerved: For the reſt is to be left to Nature.

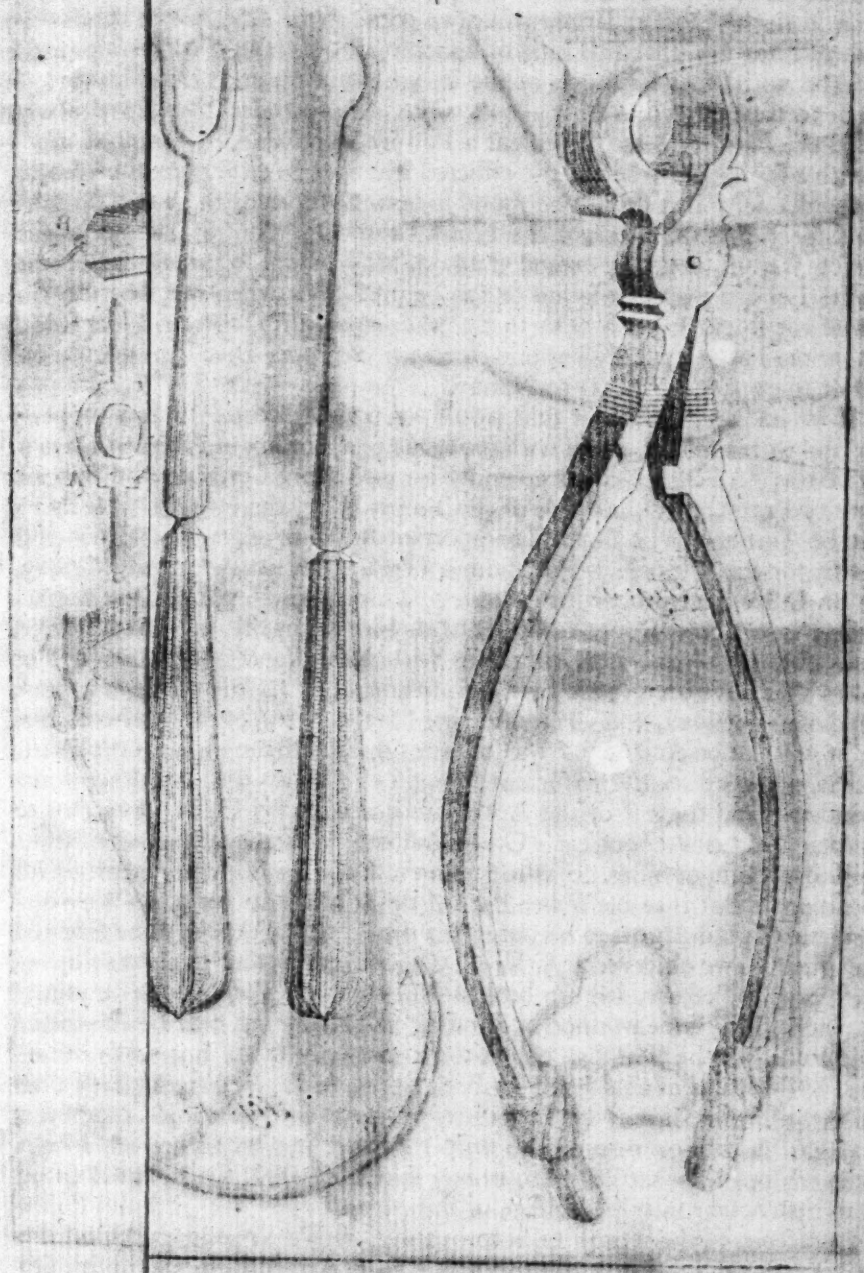
How ſuch a fractured Thigh is to be retained in its proper Situation.

VIII. If we had an Inſtrument that would keep the fractured Thigh properly extended, and of the ſame Length with the ſound one, for about fourteen Days or till the Cure was perfect, we could go on with much more Certainty and Succeſs, in the Cure of Fractures in the Neck of the Thigh-bone, than we do. He therefore would be Author of a no ſmall but important Advantage that ſhould contrive a Machine fit for this Purpoſe. For though HILDANUS has deſcribed (*Cent.* 5. *Obſ.* 86.) an Inſtrument proper for extending Thighs which are obliquely fractured; there is yet great Room to doubt of its Fitneſs for this kind of Fracture. For he does not, that I know of, ſupply us with any Inſtances of Extenſions or happy Cures that have been made by this Inſtrument. But till we have a more proper Machine contrived, and when the other Means are not found of themſelves ſufficient, it will not be amiſs to uſe the forementioned Inſtrument of HILDANUS, or when that is alſo of itſelf inſufficient, to add the Straw-pad, the large four-headed Bandage, and the reſt of the Apparatus deſcribed by HILDANUS; or to bind two long Napkins about each Groin, faſtening them by Nails or Rings to the Head-Bed-poſts or Sides, ſo as to retain the Patient's Body ſufficiently firm from deſcending. But that the lower Part of the Limb may not give Way upwards, a Ligature or Bandage is to be put round the Knee and Ancle, to be faſtened to the Bed's Feet, as we obſerved at §. VII. by which means the Limb may be retained in its proper Poſture, till the broken Neck of the Thigh-bone be joined firmly together. The ſame Method of Binding and Retaining may be alſo uſeful in other Fractures of the Thighs, but is found not only uſeful but really neceſſary in oblique Fractures of this Limb. But to prevent the Napkins or Ligatures from galling the Groins, it may be ſometimes proper to interpoſe ſoft Compreſſes or Lint; and for Advice concerning the proper Poſture in which a broken Thigh is to be retained, beſides what has been briefly ſaid at *Chap.* I. §. 36. we ſhall be more full and particular in the Doctrine of Bandages.

A Fracture of the Thigh with a Wound.

IX. If a Fracture of the Thigh be accompanied with a Wound, it makes the Caſe very dangerous and difficult to cure; and if theſe Accidents ſhould happen to be inflicted on the neighbouring Joint, Death is generally the Conſequence; more eſpecially when any of the large Blood-veſſels are wounded, as muſt be evident from the great Hæmorrhage: So alſo is the Fracture dangerous, when the Wound is

ſeated



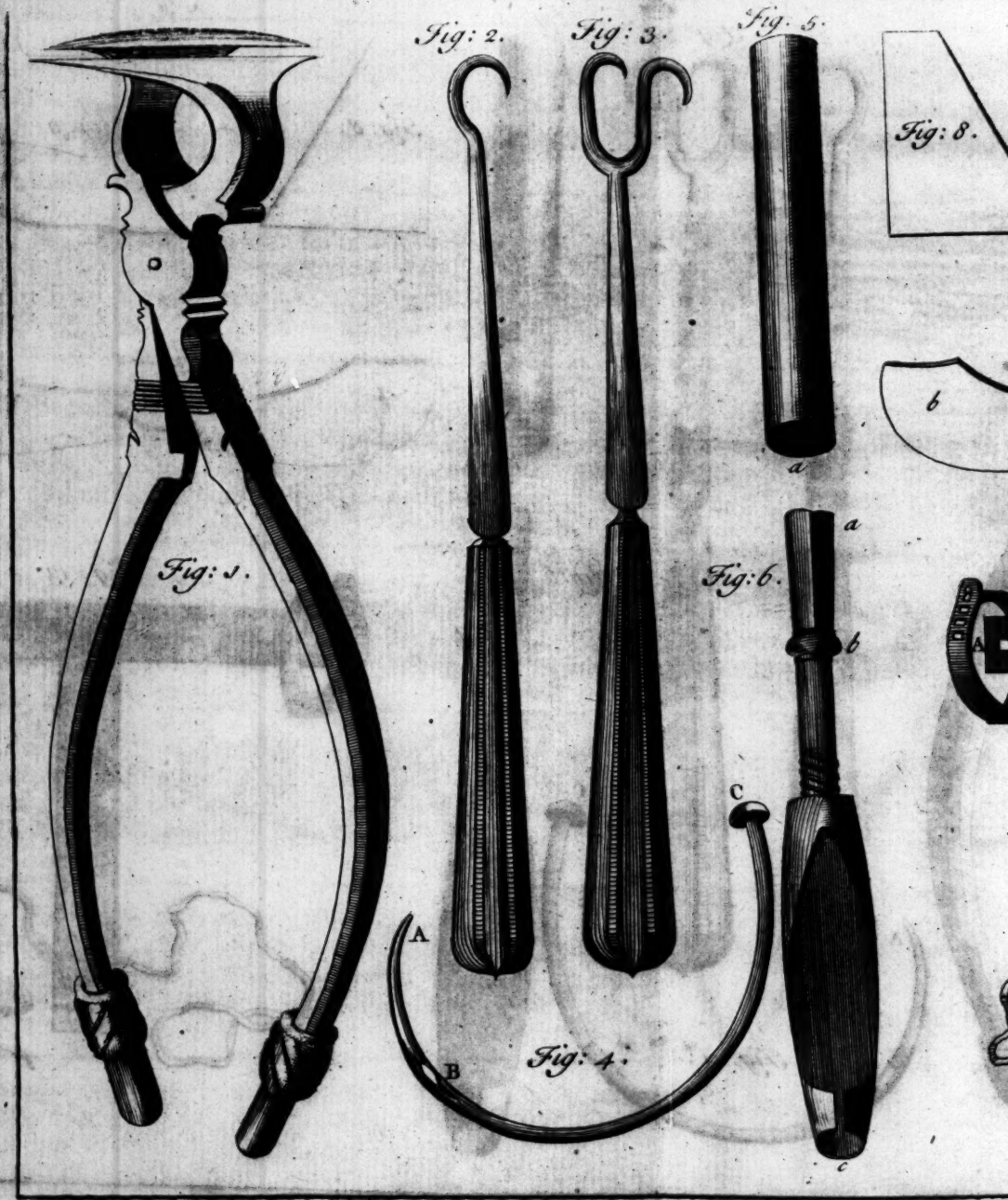


Fig: 1.
Fig: 2.
Fig: 3.
Fig: 4.
A
B
Fig: 5.
a
Fig: 6.
a
b
c
C
Fig: 8.
b

Fig: 7.

Fig: 8.

Fig: 9.

Fig: 10.

b b a

Fig: 13.

A A

Fig: 14.

Fig: 15.

A E B D C

B

Fig: 16.

A

A A

Fig: 17.

B B C

Fig: 11.

Fig: 12.

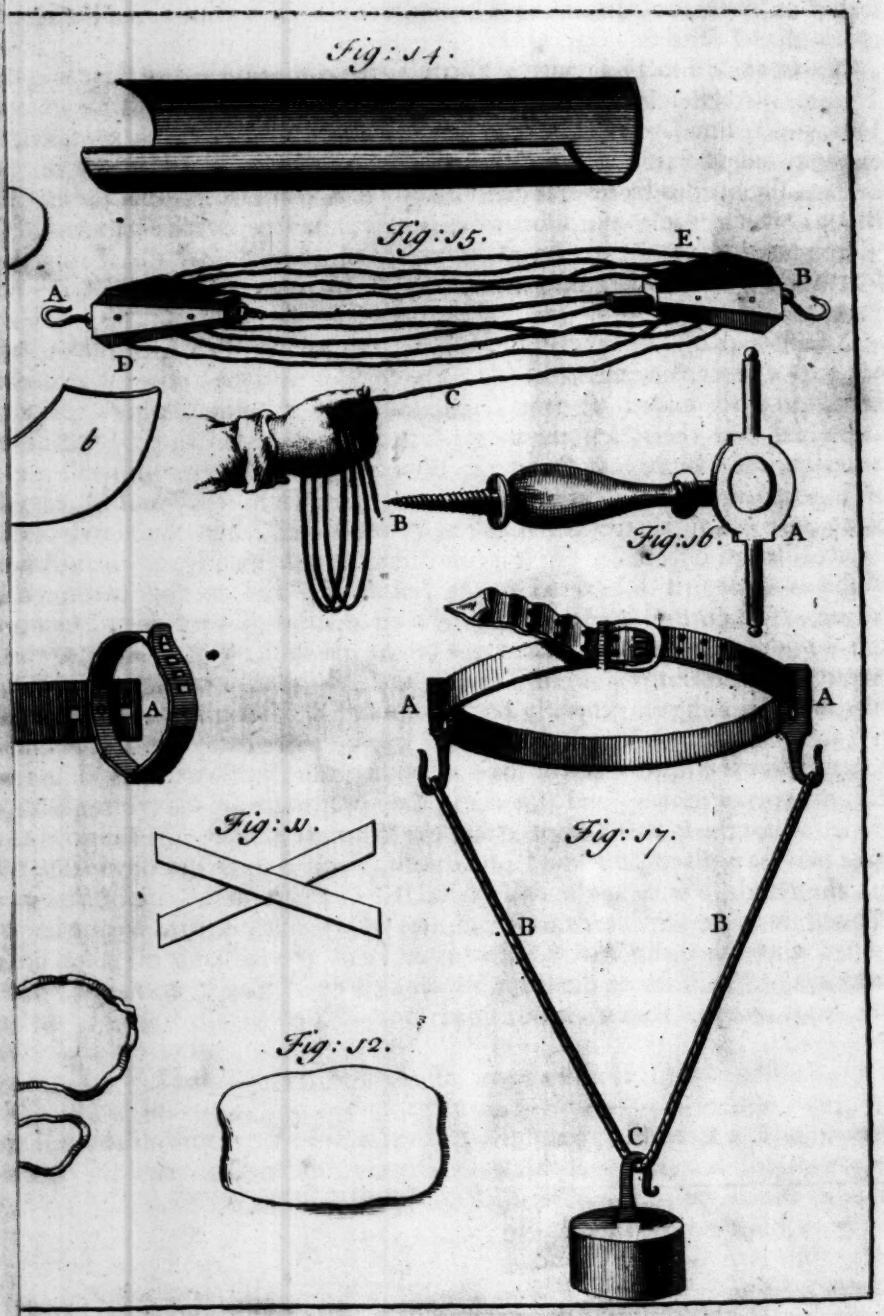


Fig: 14.
Fig: 15.
A
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Fig: 16.
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Fig: 11.
Fig: 17.
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Fig: 12.
C

ſeated in the back part of the Thigh; becauſe it is with great Difficulty to be cleanſed and dreſſed.

X. In theſe Fractures with a Wound, the eighteen-headed Bandage, *Tab.* 9. *Fig.* 4. is to be uſed for the Dreſſing: This is deſcribed at large in our third Part, upon Bandages. But if the wounded Part be very much contuſed, ſo that extravaſated Blood be lodged under the Skin and about its Interſtices, it is to be carefully opened by ſeveral Inciſions of a ſufficient Depth, that the extravaſated Blood, which would in a ſhort time putrify, may be by this means diſcharged. The injured Parts are to be afterwards waſhed with *Aq. Calcis* mixed with a fourth Part of *Sp. Vin. Camph.* or ſome ſuch reſolving Liquor, till the contuſed Parts are digeſted. Cure.

XI. When this kind of Fracture is accompanied with loſs of Blood, which is not very violent, nor the Bone near, the Wound is to be dreſſed with dry ſcraped Lint, properly folded, ſo as to fill the Wound; more and larger Compreſſes are to be laid over theſe, and the whole is to be retained with a proper Bandage, as is uſual in Hæmorrhages. But if the Flux be greater, we recommend the Uſe of aſtringent Liquors, ſuch as are uſed to ſtop the Hæmorrhages of Wounds, eſpecially the moſt highly rectified Spirit of Wine, which is here found to be extremely ſerviceable and effectual; but if it run ſtill more vehemently, from an Artery, the Veſſel is to be firſt diſcovered by the *Tournequet*, and afterwards ſecured by Ligature. When this kind of Fracture is attended with very great Hæmorrhage, and a violent Splintering of the Bone from Gun-ſhot, ſo as to indicate the crural Artery to be lacerated; if our Deſire is ſincerely to ſave the Life of the Patient, our beſt Method will generally be to amputate the Thigh and tie up the Artery in Time; for by this Means the Patient will be more eaſily preſerved, than if we ſtrive to ſave the lower Parts of his Limb; for the crural Artery is ſo large that it ſeldom grows together, and if it does, the lower Parts are ſoon ſeized with a Gangrene. After the Blood is ſtopped and the Wound cleanſed, the Fragments of the Bone may be replaced, and the Limb carefully bound up with Compreſſes, Splints, and the Bandage with eighteen Heads, defending it in a Caſe of Straw. The Wound is to be afterwards unbound every Day, cleanſed from its Matter, and dreſſed with ſome digeſtive Ointment or vulnerary Balſam, till it be healed.—Inſtances of Fractures of the Thigh with a Wound may be ſeen in SCULTETUS *Obſ.* 77, *and* 78. PURMAN *Obſ.* 63. When accompanied with Hæmorrhage.

An EXPLANATION *of the* EIGHTH TABLE.

Fig. 1. Is a ſort of large and ſharp *Forceps*, proper to cut off the Splinters or Fragments of Bones, which ſtick out; but to make them cut the eaſier, the Handles ſhould be two or three Inches longer than the Figure. *Tab.* VIII. explained.

Fig. 2. Is a ſimple Hook.

Fig. 3. Is a double Hook, ſerving for various Purpoſes in Surgery and Anatomy.

Fig. 4. Is a Needle, for taking up Arteries with a Ligature in Hæmorrhages, and many other Caſes. A, is its blunt Point, B, its Eye tranſmitting the Thread, C, its little Head.

Fig. 5. Is a Caſe to hold the ſubſequent Inſtrument, which is uſed to hold and apply the *Lapis Infernalis* or Cauſtic Stone.

Fig. 6.

Fig. 6. The Inſtrument itſelf, made of Steel, for holding and conducting the ſaid Stone. a, the Nippers which lay hold of the Stone; b, the little Ring which ſhuts and holds them faſt upon the Stone; c, the other End of the Inſtrument uſed as a ſticking Quill to ſupport the Lips of Wounds.

Fig. 7. Exhibits the Figure of a Splint, made of thin Wood or Paſte-board, to be uſed in Fractures of the Arms and Feet; its Breadth ſhould be about three or four Fingers, and its Length ſuitable to the Size of the Limb.

Fig. 8. Is a Paſte-board Splint, ſuch as is ſometimes uſed in Fractures of the Noſe: Its Size is to correſpond to that of the Noſe.

Fig. 9. Is a Splint of Cap-paper, ſuited to the lower Jaw, when fractured only on one Side.

Fig. 10. Is a double Splint of the ſame kind, for the lower Jaw, when fractured on both Sides: It is to be applied ſo that the Aperture (a) in the Middle may let in the Chin; but its two Extremities or Wings (bb) which may be folded together in the Middle (a), are to be applied towards the Ears.

Fig. 11. Is a Compreſs, in Form of an X, to be uſed in Fractures of the Clavicle.

Fig. 12. Is a Paſte-board Splint, to be laid over the former Compreſs, in the ſame Fracture.

Fig. 13. Is an Iron or Steel Inſtrument in the Form of a T, uſeful to retain the Shoulders in a proper Poſture, in Fractures of the Clavicle. AA its tranſverſe Part, to which are faſtened Iron Rings, to retain and keep back the Shoulders; B, its perpendicular Part going down the Back: C, an Aperture in its lower End by which it is to be faſtened with a Ligature round the Waiſt, to be tied before on the Belly. *See Chap.* V. §. 5. foregoing.

Fig. 14. Is a Paſte-board Caſe, in which a fractured Arm is to be lodged after it has been ſet and dreſſed; its Size is to be anſwerable to the Arm.

Fig. 15. Is a *Polyſpaſton* or compound Pulley, uſed to extend Fractures, deſcribed before at *Chap.* VIII. §. 4. A, and B, are two Hooks, by which the Inſtrument is faſtened on both Sides; C, the Rope, by drawing which an Extenſion is made upon the broken Limb; D, and E, are the two Pulleys, conſiſting of ſeveral Wheels, by which the Force of the Drawer is very much encreaſed.

Fig. 16. Is a ſtrong Iron Screw, whoſe Worm or Thread B, is to be forced by the two Handles, into ſome Beam or Rafter; and upon its Ring A, is to hang the Pulley E, foregoing.

Fig. 17. Is the Girt of HILDANUS, ſometimes neceſſary to make Extenſions upon the upper and lower Limbs: AA, two Hooks, upon which is hung the Sling or Rope BB; C being the Place where the extending Force is to be applied.

CHAP. IX.

On a FRACTURE *of the* Patella, Rotula, *or Knee-pan.*

The Nature of this kind of Fracture.

I. IN order the better to underſtand and cure a Fracture of the *Patella*, it is previouſly neceſſary to learn from Anatomy, the manner in which it adheres by means of Ligaments and Tendons to both the Leg and Thigh; where we may alſo obſerve its Aſcenſion with the contracting Muſcles upwards in

in extending the Foot, its Deſcenſion upon bending the ſame, and the great Force it ſuſtains both Ways in violent Motions of the Body. When a Fracture of this Bone happens from a Fall, Blow or any other external Violence; the Courſe of the Fracture is either longitudinal, tranſverſe or in ſeveral Directions at the ſame Time: But of all, the Tranſverſe Fracture is moſt frequent. The Longitudinal happens much ſeldomer, and is more readily cured; becauſe the Fragments in this Caſe, generally keep in their right Places [a]. But when the Bone is broke tranſverſly, and into many Pieces, the Caſe is uſually much more dangerous. For though the lower Part of the Bone keep in its Place, as being not annexed to any Muſcles; yet the ſuperior Part of the Bone is drawn upwards, by the very ſtrong Muſcles to which it is joined, which makes it very difficult to reduce and retain.

A Fracture of the *Patella* eaſy to diſcover.

II. The Diſcovery of this kind of Fracture, is uſually Matter of no great Difficulty. For it may be eaſily perceived by the Fingers whether the *Patella* be ſound or divided; and alſo, when it is divided, whether it be broken tranſverſly, longitudinally, or into many Pieces: Whether the Fragments adhere to each other, or are ſeparated at ſome Diſtance. In examining this Fracture, forcible Flexures of the Knee are to be avoided as of no Service, but very painful and pernicious; becauſe, by this means, the Fragments are pulled farther from each other; and PETIT gives an Inſtance of Death occaſioned thereby. But it ſometimes happens, through the Obeſity of the Patient, and the little or no Separation of the fractured Parts, that this Caſe is not ſo ſoon to be diſcovered as is otherwiſe common: But then the Fracture is alſo leſs dangerous; for the Juice of the Bone, of which the Callus is formed, cannot ſo eaſily inſinuate itſelf into the Articulation, whereby the Knee would become rigid and immoveable, which frequently happens in ſome Fractures of the Bone.

Prognoſis.

III. It is generally a very difficult Matter to make a perfect Cure of this Fracture, as thoſe experienced herein have often found: For if we may believe Practitioners, the Joint is generally left either rigid, or at beſt its Motions are performed with Difficulty. For beſides the Inſinuation of the oſſific Juice, which was deſtined to the Formation of Callus, into the Receſſes of the Articulation; the Mucilage alſo, which lubricates the Joint itſelf, mixes and indurates with it; ſo that the Bones of the Leg and Thigh being joined together like two Pieces of Wood with the ſtrongeſt Glue, the Joint becomes ſtiff, the Bones grow together and become like one. And this happens the more readily, becauſe of the long continued Inactivity of the Joint till the Bone is united, which is extremely neceſſary in theſe, and eſpecially in tranſverſe Fractures; by which long Inactivity, the lubricating *Mucus* of the Joints generally grows thick and hard. But it alſo uſually happens, that the Tendon which ſuſtains the *Patella*, and chiefly directs the Motion of the Joint, is violently contuſed at the ſame Time, and from the ſame Cauſe, with the Fracture of the *Patella*; upon which Account, alſo, the Motion of the Knee is greatly impeded or wholly deſtroyed. We therefore need not wonder that thoſe who have once broke one of their Knee-pans, ſhould be ſo ſubject to frequent Falls, and in Conſequence of them break the other: Since the violent Contuſion of this Tendon always leaves an incurable Weakneſs in the Joint.

[a] Indeed GARENGEOT (*Lib. de Inſtrum. Tom.* II. *Pag.* 310.) thinks that this Bone cannot be broke longitudinally; but that this Caſe ſometimes happens, has been ſhewed by PETIT, among many others, in his Chapter of a fractured *Patella*.

IV. With

Cure.

IV. With regard to the Cure of a fractured *Patella*, it muſt be attempted in the following Method: In a longitudinal or perpendicular Fracture, the Patient muſt be laid upon his Back, and extending his Foot, the Surgeon in the mean Time replaces the Fragments on each Side with both his Hands, binding them up carefully with the uniting Bandage: Which muſt be applied here in the ſame manner with that uſed in large Wounds of the Belly and Forehead, which we have before taken Notice of, and ſhall deſcribe more largely in the Doctrine of Bandages. But when the *Patella* is broken tranſverſly, or into ſeveral Pieces, the Patient being put in the ſame Poſture and extending his Foot as before; the Surgeon is then carefully to endeavour to bring together, compreſs, and replace the Fragments of the Bone in their natural Situations, with the Palms of his Hands, Thumbs, and Fingers; retaining them firm with the Application of a Plaſter in Form of a half Moon (*Tab.* 9. *Fig.* 2.) or perforated (as at *Fig.* 3.) and then the Foot of the afflicted Member is to bound up and placed ſo that it cannot be eaſily bent or otherwiſe diſturbed. We intend to be more particular on the whole Buſineſs of the Cure, in the Doctrine of Bandages. But notwithſtanding there are to be found ſeveral particular Machines invented by Surgeons [a] for retaining this kind of Fracture; they all ſeem to be of ſuch a Make as to fall vaſtly ſhort of being ſufficient for the preſent Deſign. But to prevent the replaced Bone from being diſturbed or broken a-freſh, which is an Accident we find often happens; it muſt be carefully obſerved that the Patient do not any Way exerciſe his Leg till after the Expiration of the ninth or tenth Week. For a Fracture of the Knee-pan is ſeldom ſufficiently united before that Time; and ſuch as uſe their Legs before that Time, generally halt in Walking as RUYSCH (*Obſ.* 3) obſerves. Further upon this kind of Fracture, the Obſervations which PURMANNUS has collected in his Surgery (*P.* III. *C.* 21.) deſerve to be conſulted.

CHAP. X.

Of FRACTURES *in the Bones of the Leg and Foot.*

Fracture of the Leg.

I. THERE is but little to be ſaid new on Fractures of the Leg and its two Bones the *Tibia* and *Fibula*, which has not been before obſerved here; ſo that there is no Occaſion for more than the general Directions, which we have before laid down, to be obſerved in the Cure of every kind of Fracture: *viz.* that the broken Bones are to be properly extended by Hands or Slings, and then accurately replaced; to be afterwards properly bound up, and retained in the moſt ſuitable Poſture. This I have further to obſerve, that ſometimes both the Bones, and at other Times one of them only are broken; if both, it ſeldom happens that each of them are broke directly in the ſame Place, but one of them a little higher than the other. If the *Tibia* alone be broke, it is eaſily diſcovered, it being placed ſo near the Skin; but if the *Fibula* alone, which is buried under ſo many Muſcles, the Fracture is not ſo eaſy to be diſcerned. And when only

[a] SOLINGEN recommends an Inſtrument of this kind in his Surgery, in the Chapter of a broken *Patella*: And in *Tab.* 15. *Fig.* 26. Edit. *Amſtel.* 1698. we find the Machine delineated. GARENGEOT (*Lib. de Inſt. Chirurg.*) has alſo deſcribed another; and we are acquainted with ſtill more.

the

the *Fibula* is broke, the Patient is generally under much leſs Diſorder; in ſuch a manner, that it frequently permits them to walk. But to obtain a proper Knowledge of the Diſpoſition of this Bone when it is fractured, the Calf of the Leg is to be graſped by one Hand, whilſt the other Hand moves the Foot; and in the mean time the Hand, which holds the Leg, will perceive whether and where it is fractured. If, as it frequently happens, a Fracture of the *Tibia* ſhould be accompanied with an external Wound of the Skin; this muſt be firſt well cleanſed, and the Splinters of Bone, with all foreign Bodies removed: Then the broken Bone, after a proper Extenſion, may be reduced into its right Place; the Hæmorrhage, if there be any, may be afterwards ſtopped, (as we ſhewed at *Chap.* VIII. §. 11.) and the Limb then be bound up firmly with the eighteen-headed Bandage, cut ſomewhat in the Form of a Book, as at *Tab.* 9. *Fig.* 4. which we ſhall demonſtrate more fully hereafter in *Chap.* VIII. of Bandages. But if any Fragments of the Bone ſhould ſtick out ſo as to obſtruct its Reduction, they ſhould be firſt removed by a Pair of ſharp *Forceps*, or a fine Saw, before any Attempt be made to reduce or bind up the Fracture. Having proceeded rightly ſo far, the laſt Step is to place the Limb in a ſtraw Caſe, or elſe in a braſs Frame (*Tab.* 9. *Fig.* 9.) purpoſely accommodated to retain Fractures of the *Tibia*; renewing the Dreſſing and Bandage daily, till the Wound be healed. Sometimes little Pieces of the Bone will be ſet at Liberty and expoſed to Sight by the Suppuration, in the Courſe of the Cure; which are to be then laid hold of, removed, and the Cure continued as before. An Example of a fractured *Tibia* with a Wound may be ſeen in SCULTETUS, *Obſ.* 82, *and* 84.

II. A very uſeful and proper Machine or wooden Caſe for retaining the preceding Fracture, has been alſo contrived and deſcribed by Monſ. PETIT, a celebrated Surgeon of *Paris*, firſt in the *Act. Acad. Reg. Pariſ. Ann.* 1718. and afterwards in his Treatiſe of Diſeaſes of the Bones, from whence GARENGEOT transferred it into his Book of Chirurgical Inſtruments: We chuſe to exhibit the Machine rather from the *Act. Reg. Pariſ.* [a] than from the Inventor's Book on the Bones, or GARENGEOT's of Inſtruments; becauſe in the two latter, the Inſtrument is repreſented only put together, and therefore may not be intelligible to ſome, as if exhibited in a double Light, according to the other. You have it therefore firſt whole or put together in *Tab.* 9. *Fig.* 11. and then ſeparated into its component Parts at *Fig.* 12. The Baſis or principal Part of the Machine AA (*Tab.* 9. *Fig.* 12.) is to be gently put under the broken Leg (after it has been firſt ſet, the Wound properly dreſſed, the whole bound up with the Bandage of eighteen Heads, and defended with Splints tied on with three Strings, as is uſual,) the two lateral Parts of the Caſe BB, and its Front C, which ſerves as a Sole to the Foot, are faſtened together by the Hinges DD, and kept ſhut by the Hooks EE, as may be ſeen at *Fig.* 11. by which means the Foot cannot ſlip or ſhake, but is held firm and eaſy to the Patient: FF is the lower Part or Foot of the Machine, ſerving as a Foundation to the reſt; at its End GG it is joined by Hinges to the preceding Floor AA, whoſe ſloping Part ſlides under the Thigh: Over the Floor AA, Pieces of ſtrong Tape or Ticken are to be nailed tight to the Sides, upon which the Limb reſts eaſier than upon

PETIT's Machine for theſe Fractures.

[a] Tho' it is a great Pity that the Author has not there ſubjoined a particular Explication of his Figures, by annexed Letters or Numbers; becauſe it is probable that ſome Parts will not be rightly underſtood by many.

the Plank or Board. The other Parts of this Caſe ſeeming to be very obvious from the Figure, we ſhall, for brevity, omit any Explanation of them, and only obſerve that its Size is to agree with that of the Limb. But by reaſon of the vaſt Numbers of Fractures which happen in a War, and the great Scarcity and Cumberſomeneſs of theſe Machines at ſuch Times, the Camp Surgeons are generally obliged to ſubſtitute Caſes of Straw in the room of them. At every Dreſſing of the Limb the Hooks EE are to be undone, and the three Sides opened; but when the Wound and Fracture are dreſſed and bound up, the Foot muſt be exactly placed and the Caſe faſtened as before.

Fractures of the Bones of the Feet.

III. Laſtly, the Bones of the Foot, which compoſe the *Tarſus*, *Metatarſus*, and Toes, are equally liable to Fractures in the ſame way with thoſe of the Hands; but by reaſon of the great Complication of Nerves, Tendons, Ligaments, and Membranes, Fractures in this Part are uſually attended with Wounds and the worſt of Symptoms. The Bones are to be replaced, and the Cure carried on much in the ſame manner alſo; except the Difference of Bandage, which we ſhall explain when we come to the particular Doctrine of them. This we may alſo obſerve in the general, that Fractures of the Feet, like thoſe in the Hands and Ancles, can ſeldom be ſo perfectly cured as to leave no Stiffneſs nor Want of Motion behind, if they ſhould eſcape the Company of an Ulcer, *Caries*, or incurable *Fiſtula*. Which laſt bad Symptoms are often to be remedied by no means but that of amputating the Member; nor will even that always preſerve the Patient from Death: 'Tis one's Intereſt therefore, in violent Fractures and Contuſions of this Part, to give timely Intimation of the Danger to the Patient, or at leaſt to his Friends; leſt the miſerable Condition of the Patient ſhould be afterwards raſhly attributed to ſome Miſconduct in the Surgeon, as they too often are. But if any body be deſirous of a larger Acquaintance with Fractures of the Bones, I muſt recommend him to the diligent Peruſal of the celebrated PETIT's Treatiſe on Diſeaſes of the Bones.

CHAP. XI.

Of Bones broken by ſharp pointed Inſtruments, which may be termed Wounds of the Bones.

Wounds of the Bones.

I. HITHERTO we have been treating of Fractures of the Bones, occaſioned by blunt Inſtruments; it remains now that we conſider ſuch as are produced by ſharp ones, as Darts, Swords, Spears, *&c.* which may not improperly be called Wounds of the Bones; for which Reaſon a few Writers have treated of them ſeparately. For theſe Weapons do not only cut aſunder and ſeparate the ſoft and fleſhy Parts, but do alſo the ſame to the hard Bones, which they divide ſometimes ſlightly, ſometimes greatly, and often they make a Solution equal to a Fracture; but theſe Wounds cannot be inflicted upon the Bones without being attended with a great Variety of Symptoms, which are often very grievous, according to the Size and Depth of the Wound, the Nature of the Part, and the Force with which it was inflicted; as whether the Violence be received in the Head, Noſe, Jaws, Fingers, Hands, Arms, Shoulders, Legs, or Thighs. As therefore the Knowledge of theſe Accidents

cidents is of great Importance; and as they require a ſomewhat different Method of Treatment from other Fractures, it was here proper to ſay ſomething in particular of the beſt Method to be taken for their Cure.

II. But before we proceed to the Method of Cure, it muſt be firſt obſerved, that ſuch ſlight Wounds as do not penetrate deep into the Bone, are generally not ſo very dangerous; eſpecially if we proceed regularly in the Cure, keeping the Bone covered as much as poſſible with its Integuments from the Action of the Air, and wholly reject the uſe of fat or oily Medicines, as very prejudicial to the Bones. But when they penetrate deep, wholly divide the Bone and its adjacent Parts, or violently affect any Organ more directly neceſſary to Life, in the Head, Neck, *Spina Dorſi*, and Breaſt, with a Puncture or Diviſion of the larger Veins, Arteries, Nerves, and Tendons of the upper or lower Limbs; the Danger is then much greater, and the Cure more difficult, Death being often the Conſequence. *Their Prognoſis.*

III. In the Cure of theſe Fractures by ſharp Inſtruments, PETIT inadvertently adviſes in his Treatiſe on Diſeaſes of the Bones, though in other reſpects a very good Surgeon, "That in this kind of Accidents in the Bones, if the Solu-"tion be inflicted lengthways, the Lips of the Wound are to be cloſed together, "and cured with the uniting Bandage; but ſuch as are inflicted very obliquely, "or wholly tranſverſly, are to be joined together by Suture and the Bandage "that has eighteen Heads." But as this Method is unſucceſsful in many Wounds of this kind, and ſo might lead young Practitioners out of the way, it will be not improper here to expound this matter more fully, and ſet it in a clearer light. Indeed in the firſt kind of theſe Wounds I do almoſt agree with him, eſpecially when they are ſlight, as when the Skull is not wholly nor deeply penetrated and without Contuſion, nor the Brain much hurt, as we have obſerved in Wounds of the Head, *Chap.* XIII. §. 11. But when the contrary of theſe obtains, we muſt proceed more cautiouſly, and in a Method very different, keeping the Wound open with Lint, cleanſing it, and when cleanſed, healing it with Balſams, as we have obſerved in treating of Wounds. For by a too ſpeedy Cloſure of ſuch Wounds, the moſt violent Symptoms, and often Death itſelf, have been frequently brought on. So alſo in the ſlighter Wounds of this kind which are inflicted obliquely or tranſverſly; I do not approve with PETIT of uſing promiſcuouſly the Suture and eighteen-headed Bandage; but on the contrary, inſtead of a general uſe, I think them the moſt ſeldom neceſſary; for I have ſeen cured by others, and have often cured myſelf, many of thoſe Wounds in the Bones without the uſe of that Bandage or Suture. To make the thing more apparent by Example, in oblique Wounds of the Head, Forehead, and *Cranium*, which are none of the violent kind, the Parts may be retained and cloſed much eaſier by a Plaſter and common Bandage, than by Sutures made with Needles and Thread, as PETIT ſeems here to direct; and ſtill much leſs occaſion is there for the Bandage with eighteen Heads: But as I have ſaid in the Chapter of Wounds in the Head, theſe are generally more eaſy to cure by agglutinative Powders, Balſams, and Plaſters, whether Bones wounded be the Jaws, Clavicles, Shoulder-blades, or in the upper or lower Extremities. But when the divided Part hangs down, ſo as not to be kept rightly rejoined to its oppoſite by theſe means, the Suture then ſeems altogether neceſſary.

Wounds of the Finger Bones.

IV. If the Bones of the Fingers ſhould be thus wounded, or wholly divided by a Sword, ſo as only to hang by the Skin and Fleſh; I have happily cured them, without the Suture and eighteen-headed Bandage, in the following manner: I firſt accurately replaced the divided Bone, and retained them joined together in that Poſture by winding round a Slip of Plaſter; then applied a Compreſs dipped in *Sp. Vin.* laying over little Splints of Paſte-board for retention of the broken Bones in their right and natural Poſture; and laſtly I bound up the whole firm with a proper long and narrow Bandage, ſuſpending the Hand in a Sling, hung about the Neck for that Purpoſe. This I left ſo for ſeveral Days, ordering nothing more than for the Patient to keep up to a proper Diet and Reſt. At length I carefully undid the Bandage, and tenderly removed the Compreſs but not the Plaſter, and after cleanſing the Wound as well as it would admit, I dropped in ſome vulnerary Eſſence, and applying a freſh Compreſs dipped in *Sp. Vin.* bound it up again as before. Thus it was again left for ſeveral Days more, and in about every three Days it was dreſſed in the ſame method, till after the Space of about a Month it was quite firm and well.

Wounds of the Arm and Leg Bones.

V. If either of the Bones of the *Cubitus* is divided, it generally happens to be the *Ulna*, that being moſt expoſed to the Weapon in fighting, nor does it then require either the forementioned Suture or the Bandage; but the Wound being cleanſed, is to be treated with ſome vulnerary Eſſence or Balſam, and with Lint dipped in the ſame Eſſence, after which are to be laid on in order the Plaſter, Compreſs, and Paſte-board Splints wetted with *Sp. Vin.* which are to be bound round the thick Part of the *Cubitus* near the Wound with a long Bandage, that, as they dry, they may accommodate themſelves the better to the Figure of the Part; and laſtly, the Arm is to be ſuſpended in a Sling hung as uſual about the Neck: And thus dreſſing the Wound every other or once a Day, in Proportion to the Diſcharge, a Cure may be brought about without any Suture, which I here judge to be pernicious. But when both the Bones of the Leg are broke, I do then indeed uſe the Bandage with eighteen Heads, as in other Fractures of the Leg and Thigh; but hardly the Suture: Becauſe there is ſeldom or never occaſion for it in Fractures of the *Tibia* alone, which is covered with ſcarce any thing more than the Skin; and it is extremely rare that it is required in Fractures of the *Fibula*, unleſs ſome of its large Muſcles are divided: For we are to refrain from the uſe of Sutures as much as poſſible, becauſe they generally excite Inflammation, Pain, Convulſion, and other bad Symptoms; ſo that we cannot approve of their uſe, but in the greateſt Neceſſity, where we perceive the Cure of the Wound cannot be effected without.

Wounds in the Arm and Thigh Bone.

VI. If the Thigh Bone ſhould be cut by a Sword, then, the better to cloſe and retain thoſe ſtrong Muſcles, a Suture made with Needles and Thread, as in ſome other Wounds (*Book* I. *Chap.* I. §. 33 *and* 34.) will certainly be of Service; the Wound is to be treated in the Method we have there taught, bound up with the eighteen-headed Bandage, and the Limb is to be placed carefully in a Caſe of Straw, as in other Fractures. So alſo, if the Bone of the *Humerus* or Arm ſhould be penetrated by a Sword, it ſhould, for the ſame reaſon, be treated with the Suture as before; yet not dreſſed with the eighteen-headed Bandage, but a long and narrow one, as in other Fractures of the Arm. The Arm is afterwards to be ſupported by a ſhort Napkin, faſtened about the Neck; by

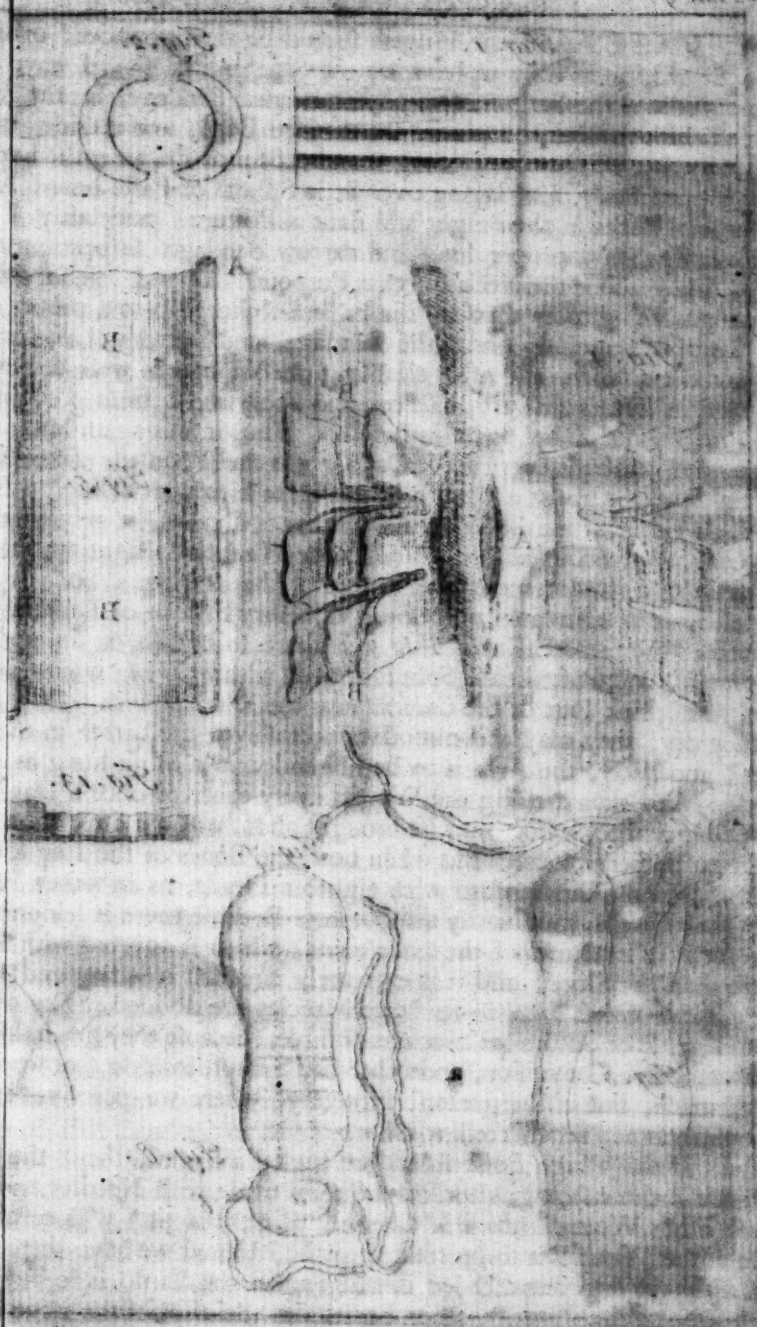

Plate 9.

Fig. 1.

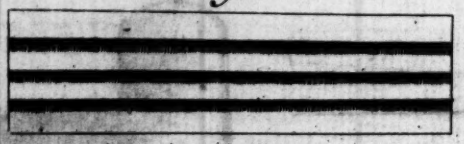

Fig. 2.

Fig. 3.

Fig. 4.

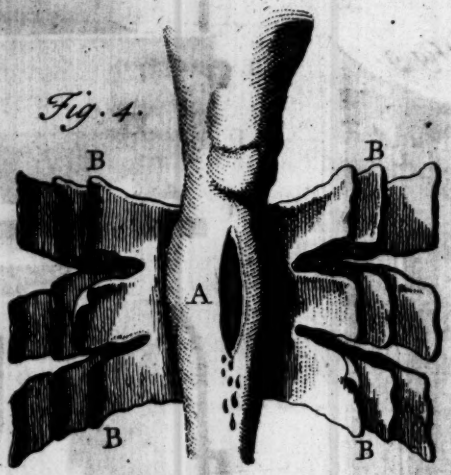

Fig. 5.

Fig. 9.

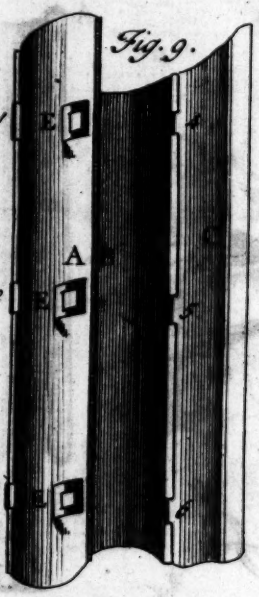

Fig. 13.

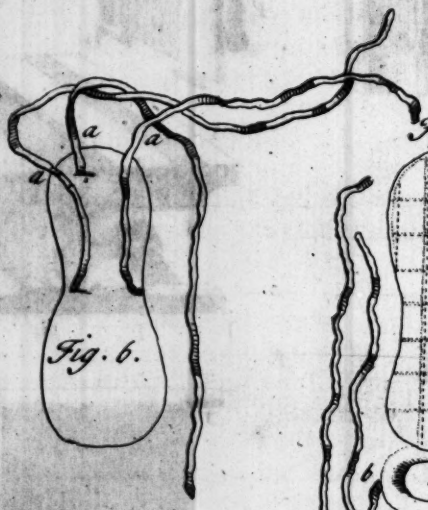

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 10.

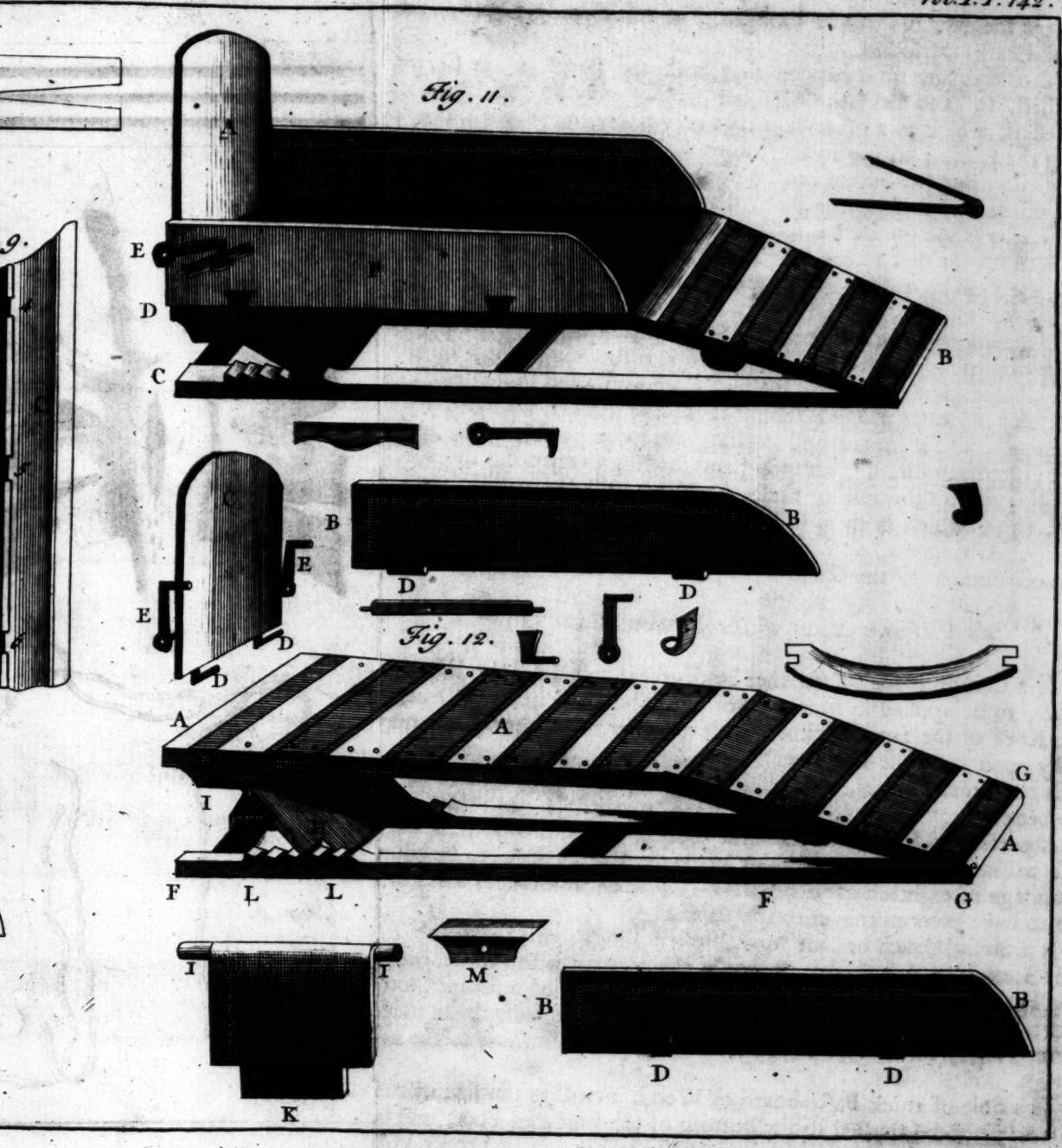
Fig. 11.
A
E
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Fig. 12.
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L
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M
B
B
D
D
K

Fig. 11.

by which means the Muſcles will be brought to a more ready Union, and the Cure ſooner and eaſier perfected.

VII. If it ſhould at any time happen that both the Bones in the *Cubitus* or *Crus* are divided, ſo as to leave the Member hanging only by the Fleſh, Skin, and Blood Veſſels, which is an Accident that very rarely happens without wholly amputating the Limb; then alſo the Suture with the eighteen-headed Bandage are to be applied. But the Suture can be of no Service when the Part is wholly or ſo far cut off as to hang by the Skin, its Nerves and Blood Veſſels being divided; eſpecially when the Part is ſo conſiderable as the Leg or Arm: For in that Caſe it is much the beſt to take the Limb quite off, to ſtop the violent Hæmorrhage of the Veſſels, as in other Amputations, and to dreſs the Member in the ſame manner. Of both the Bones of the *Cubitus* and Leg divided together.

VIII. When the lower Jaw is ſo cut by a Sword that the Piece ſeparates much, and cannot be otherwiſe properly retained, then alſo the Suture muſt be brought into uſe; adding a proper Balſam, Plaſter, Compreſs, and ſuitable Bandage. If the Clavicle or *Acromion Scapulæ* ſhould be in like manner wounded by ſome ſharp Inſtrument, the Treatment and Bandage are to be performed in much the ſame manner; gently unbinding, cleanſing and dreſſing every other or every day, as we have obſerved in the reſt of theſe Accidents, till the Cure is perfected. The Hæmorrhage, which in theſe Injuries is often very large, muſt be ſtopped by Compreſſes, Aſtringents, or Ligature upon the Veſſels, according as which may ſeem moſt ſuitable to the Caſe. Wounds of the Jaw-Bone, Clavicles, and *Scapulæ*.

An EXPLANATION *of the* NINTH TABLE.

Fig. 1. Is a Compreſs folded together by degrees, called by the *French Compreſſe graduée*, to be applied in Fractures of the Thigh to make its ſmall Part towards the Knee of the ſame thickneſs with its other, that the Splints may act more equally upon it by the Bandage. *Tab.* IX.

Fig. 2. Is two lunar Plaſters, to include and hold firm the fractured Knee-pan after it has been ſet.

Fig. 3. A perforated Plaſter for the ſame uſe.

Fig. 4. Is a Fracture of the Leg, with an external Wound A, to be bound up with the Bandage of eighteen Heads BBBB; which commodious kind of Bandage ſeems to have been unknown to the Ancients.

Fig. 5. Is a Straw Couch or Caſe for a broken Thigh, called by the *French Fanons*, the Letters AAAA denote two Sticks covered with Straw, bound on with ſtrong Packthread; to both ſides of theſe is alſo faſtened a ſtrong Cloth BB, of about two Foot broad and three long. This Couch is uſually made twice the length of the Thigh, ſo as to reach from the Groin and *Os Ilium* to the end of the Foot.

Fig. 6. Is a Sole of thick Paſte-board or Wood, fitted to the ſize of the Patient's Foot: It is to be applied to the bottom of the fractured Foot, and bound on by the three Tapes aaa, to retain or ſtay the Foot in its proper Poſture; whence *Celſus* calls it *Mora*.

Fig. 7. Is a quilted Compreſs to be applied between the Foot and the Stay, to be ſoft, and defend it from any rough action of Paſte-board or Wood.

Fig. 8.

Fig. 8. Is a ſoft Linen Ring joined to the foregoing Compreſs, to let in and hold the Heel: It is to be faſtened to the Foot by the two Tapes b b.

Fig. 9. Is a braſs Trunk for ſecurely retaining a broken Leg; it conſiſts of three Parts ABC, which are joined by the Hinges 1, 2, 3, 4, 5, 6. The middle Part B is the Baſis or chief of the Machine, which like an hollow Pipe receives the bound-up Limb; the outer Parts A and C are as moveable Lids or Wings, which may be turned back or folded together: To each of theſe Lids AC, are joined three almoſt ſquare Loops EEE, through which are paſſed Tapes to draw them tight together, and keep them firm upon the fractured Leg. Its ſize muſt agree with the Leg.

Fig. 10. Is a wooden Arch to put over a broken Leg, to keep it from being diſturbed by the Bedcloths, *&c.*

Fig. 11. Is PETIT's new Machine Caſe, (in *French*, *Boette*) or a Box, for retaining a broken Leg after it has been ſet and dreſſed as uſual. It is deſcribed at *Chap.* X. §. 2. of Fractures foregoing.

Fig. 12. Is the ſame in Pieces, to ſhew its Structure the better. The Letter M denotes the perforated Bracket, which receives the wooden Axle or Hinge II, that it may be elevated or depreſſed. The reſt are ſufficiently explained at *Chap.* X. §. 2. foregoing.

Fig. 13. Is a Compreſs folded at one end, to fill up the Small of the Leg, that the Splints may compreſs the more equally and firmly.

THE THIRD BOOK OF THE FIRST PART.

CONCERNING LUXATIONS, OR LUXATED BONES.

CHAP. I.

Of LUXATIONS *of the Bones in general.*

What a Luxation is.

I. WE ſay a Luxation or Diſlocation has happened, when any Bone is moved out of its Place or Articulation, ſo as to impede or deſtroy its proper Motion and Office: So, for Example, we judge there is a Luxation when the Head of the *Humerus* is ſlipped out of the glenoeide Cavity of the *Scapula*, or the Head of the Thigh Bone puſhed out of its *Acetabulum* by ſome Violence. So that it hence appears that Luxations are proper only to Bones that have moveable Joints or Articulations; but, in a common way of ſpeaking, People term it a Luxation when the Bones of the Noſe are diſplaced, or when *Epiphyſes* are ſeparated from their Bones in Infants, whereby they loſe their natural uſe.

What is required previous to their Diſcovery and Cure.

II. From what has been ſaid it may be eaſily concluded what is neceſſary to be done by thoſe who deſire to be happily verſed in the Knowledge and Cure of Diſlocations: As firſt, that they ſhould have a clear Idea and Remembrance of the Form of each Articulation, with their Ligaments and Muſcles; which may be in ſome meaſure obtained from accurate Figures in Anatomical Books, but rather from a frequent and diligent Inſpection of the Skeleton and recent Bodies. For the Ligaments and Cartilages which are abſent in the bare Skeleton, may be fully obſerved, in their natural State, in a recent ſubject.

Of the ſeveral kinds of Luxations.

III. Luxations are generally diſtinguiſhed by Phyſicians into *Perfect*, and *Imperfect*. The imperfect conſiſt chiefly in this, that the Bones are here diſlocated or removed out of their Places but in part, yet ſo as that they cannot perform their Office. Some are for diſtinguiſhing this kind of Injury by the Name of *Subluxation*

Subluxation or *Diſtorſion.* But the perfect Luxation is when moveable Bones are wholly ſeparated or diſplaced from their Articulation with each other; as when the *Humerus* or Thigh Bone is removed quite out of its Socket. In both theſe kinds of Luxations the Bone may ſlip out in ſeveral directions; as externally or internally, behind or before, and above or below. Another conſiderable Diviſion of Luxations, is, into *Simple* or *Compound*; the latter when beſides the Diſlocations there is ſome other bad Symptom, as a Wound, Fracture, Weakneſs, or Straining of the Ligaments, Contuſion, violent Inflammation, or the like; but in the firſt there are none of theſe. The laſt Diviſion of theſe Injuries, is, into *Recent* or juſt inflicted, and *Inveterate* or of ſome ſtanding. The more free and moveable the Bone is in its Articulation, the more ſubject and eaſy to be diſlocated. So that it is no wonder if the Bones of the Arm are oftener diſplaced from their Articulation with the *Scapula* than thoſe of the *Cubitus* and Wriſt, and the *Vertebræ* of the Neck and Loins oftener than thoſe of the Back.

Luxation of the Head.

IV. What we have been ſaying is in common to all Diſlocations; but it remains that we deſcribe every particular kind of Luxation, beginning with the Head. We may ſuppoſe the Head to be luxated when (1.) the Bones of the Noſe gape, or (2.) when the lower Jaw ſtands in or out further than the upper; but it cannot be eaſily ſhoved out backward, becauſe hindered by a Protuberance of the *Os Petroſum*; or (3.) when the Head with the *Vertebræ* of the Neck are diſtorted to one ſide, as it may have been ſometimes obſerved by the Surgeon; or laſtly, (4.) when the Bones of the *Cranium* are forced apart by violent Pains, Fever, or Dropſy in this Part.

Luxation in the Spine.

V. Though all the *Vertebræ* which compoſe the Spine have a proper Motion, they are none of them eaſily removed wholly out of their Places, ſo as to make a perfect Luxation. But the *Vertebræ* of the Neck are much eaſier diſplaced than the reſt, becauſe ſmaller and more moveable; though theſe are generally connected very cloſely and ſtrongly to each other and the larger *Vertebræ*. So alſo the *Vertebræ* of the Loins are extremely difficult to diſlocate, though more moveable than thoſe of the Back, being ſeparated by thicker Cartilages and without Sinus's. Laſtly, the *Os Coccygis* may be ſhoved outwards in hard Births, and is ſometimes diſplaced and bent inward by a Fall or the Force of ſome other hard Body; by which means it preſſes on the *Rectum*, and very bad Symptoms follow.

Luxations of the Breaſt.

VI. As the Breaſt is made up of various Bones, ſo it is alſo ſubject to various Luxations. Thus the Ribs may by ſome violent Blow or Fall be ſhoved from their Articulation with the *Vertebræ* into the *Thorax*, to the great Damage of the Breaſt and Lungs. Sometimes it happens that the enſiform Cartilage at the bottom of the *Sternum* is depreſſed or thruſt inward by ſome Violence; ſo as to greatly afflict the Stomach. The Clavicles are alſo ſometimes diſlocated at one or both their articulated Heads, thoſe joined to the *Sternum*, and thoſe to the *Scapula*; but moſtly the firſt: Which, whenever it happens, the Arm hangs down unſupported, and its Motion obſtructed.

Luxation of the *Humerus*.

VII. If any one Bone is to be eaſily diſlocated, it is that of the *Humerus*; partly becauſe its Head is not lodged in any deep *Sinus*, and partly from its very ample and free Motion. It may be forced out either before, behind, or downwards; but never upwards, without breaking the coracoide Proceſs; for that keeps down the Head of the *Humerus* very firmly above. Though the

Cubitus

Cubitus does, at times, undergo various Luxations, it can ſeldom happen unleſs the Violence be great; and then it uſually ſuffers only an imperfect Luxation, from the Shortneſs of the Ligaments, the Deepneſs of the Articulation, and its external as well as internal Defence with Ligaments. For the *Cubitus* to be luxated forwards is hardly ever the Caſe, being prevented by the Protuberance, *Olecranon*; but then it eaſily and frequently ſlips out backwards, as from duly conſidering the Articulation will be very apparent. Luxation of the *Cubitus*.

VIII. The Wriſt is very ſeldom diſlocated from the Bones of the *Cubitus*, and hardly ever ſuffers more than an imperfect Luxation, from the Shortneſs and Strength of its Ligaments. But if it ſhould be luxated, it will much eaſier ſlip out backward and outward, than inward and forward; the Reaſon of which is not difficult; for there is a bony Proceſs on each Side the *Carpus*, where it is articulated to the *Radius* and *Ulna*, which defends it from being eaſily diſplaced. Sometimes the ſmall Bones of the *Carpus* are ſubluxated among themſelves, whence generally ariſes an Extenſion and Stiffneſs in the Hand. In like manner may the Bones of the Fingers be diſplaced; but then they are more eaſily reduced and cured. Luxation of the Hand.

IX. Among Luxations of the lower Extremities, that of the Thigh Bone comes firſt to be conſidered. The Head of the Thigh Bone may be forced out either upwards, downwards, forwards, or backward; but which of theſe ways it happens to be diſplaced, may be determined generally from the different Direction and Length of the Limb. What we have before taken Notice of (*Book* II. *Chap.* VIII. §. 6.) is alſo here worth freſh Obſervation; *viz.* that the Head of this Bone is not near ſo often puſhed out of the *Acetabulum* by ſome external Violence, as is commonly ſuſpected: For the modern Surgeons, contrary to their ſtrong Opinion of a Luxation, have generally found a Fracture in the Neck of the Thigh Bone. Nor is this to be wondered at; ſince the Head of this Bone is articulated into ſo deep a Socket, and ſecured by ſuch ſtrong Ligaments, that it cannot be diſlocated in a dead Subject by the ſtrongeſt Man or other Violence; whereas, on the contrary, the Neck of this Bone is found to be very ſmall, infirm, and brittle; ſo that it will be much eaſier for the Neck thereof to be broken, than its large Head to be forced out of its Socket. The Reaſon why this Fracture has been ſo commonly taken for, and treated as a Luxation, ſeems to be owing to the cloſe Concealment of this Part by ſo many thick Muſcles. Luxations of the Thigh.

X. From what has been ſaid, we may perceive the Reaſon why the ancient Surgeons had generally ſuch bad Succeſs in reducing this their ſuppoſed Luxation, ſcarce ever making a Cure without laming the Patient; to ſay nothing of the Torture and bad Conſequences of their improper Extenſions by Machines. They thought their not being able to reduce theſe Luxations, was becauſe they could not make an Extenſion ſtrong enough to overcome the robuſt Muſcles of this Part: Upon which Account they invented all Sorts of Pulleys and ſtrong drawing Machines, whereby they might extend and draw with the greateſt Force; Figures of which may be ſeen in SCULTETUS's *Armamentarium*. But as the Bone was not diſlocated but fractured, all the good they did the Patient was little elſe than exciting violent Pain, Convulſion, Inflammation, Abſceſs, and other grievous Symptoms: For nothing is more certain than that a true Luxation of this Bone from external Violence, was ſcarce ever at the bottom of any of their Caſes, which they, as ſome now do, ſuſpected to be ſuch; for it is A Luxation of the Thigh Bone uſually happens from an internal Cauſe.

ſcarce poſſible the Head of this Bone ſhould ſlip out of its Socket, unleſs ſome great Weakneſs or Relaxation of its Ligaments, and a Congeſtion of morbid Humours between the Joint has happened ſome time before: By which means this otherwiſe very ſtrong Ligament may, by degrees, be ſo elongated and relaxed, as eaſily to give way to ſome future external Force: Which is obſerved to happen in Children rather than Adults.

Luxation of the *Patella* and Knee.

XI. A Diſlocation of the Knee-pan is ſeldom diſcoverable by an unſkilful Surgeon, eſpecially when the motion of the Bone from its natural Seat is very eaſy and large: For if he be deſtitute of anatomical Skill in the Joint, there is great Danger of his treating it for a Diſlocation of the Knee, tormenting the Patient with Pain from an uſeleſs Extenſion: But ſuch as have before duly conſidered the natural Diſpoſition of theſe Bones, will readily perceive whether the Diſlocation be of the *Patella*, or of the Knee; for the Knee-pan is always puſhed either without or within ſide the Joint. But for the Knee itſelf, though the Head of the *Tibia* may be forced on either ſide that of the Thigh Bone; yet, as the Articulation is very broad and grooved, being defended and held faſt by exceeding ſtrong Ligaments, it never happens to be perfectly luxated.

Luxation of the Foot.

XII. The Foot indeed is not exempt from being puſhed out before or behind from the *Sinus* of the *Tibia*; but it cannot be diſlocated on either Side, becauſe prevented by the two Heads of the Bones which form the Ancle, unleſs they ſhould chance to be broke at the ſame time. The lower Head of the *Tibia* may be ſometimes ſeparated by a great Force from that of the *Fibula*, and the Foot may at the ſame time be diſlocated outwards, as we read in ſome Obſervations. The Bones of the *Tarſus* are connected to each other by very ſtrong Ligaments, and ſo cannot be eaſily diſlocated; but they are ſometimes ſo violently ſtrained, as to occaſion moſt ſharp Pain, Convulſion, and *Sphacelus*, unleſs prevented by timely Aſſiſtance. Laſtly, the Toes are ſeldom luxated; but if they ſhould, they muſt be treated like the Fingers.

The Cauſes of Luxations.

XIII. The Cauſes of Luxations are either external or internal: The external are Falls, Blows, Leaps, Strugglings, and ſuch like: The internal are preternatural Congeſtions in the Articulations; as when morbid Humours gather and relax the Ligaments ſo as to make the Joint diſlocate of itſelf, or by a Force not much greater, as riſing up, walking, leaping, *&c.* a ſad Inſtance whereof I ſaw in a Student at *Altorf*. The weaker Men are, the more ſubject to this ſort of Luxation. Hence it is that the Bones in the Limbs of Infants are ſo eaſily diſtorted, and wholly ſeparated from their *Epiphyſes*, upon a Fall, or rough handling. It is alſo worth obſerving that *Zwinger* (*Theat. Pract.* II. *pag.* 109.) knew a lame Woman that bore three lame Sons.

The Signs of Luxations.

XIV. Many and various are the Signs of Luxations of the Bones: As from (1.) the want of Motion in the Joint; (2.) the Change of Figure or natural Poſture of the Limb; (3.) an unuſual Hollowneſs or Protuberance, there being always a Tumor on that ſide where the Bone is out, and a Cavity on the other where it came from; (4.) from the difference of length in the Limb, which is uſually ſhorter when the Bone is diſlocated upwards, and longer, when downwards; or laſtly, (5.) from the Pains excited by the violent Diſtorſion of the Ligaments: For unleſs the Diſlocation be ſpeedily and rightly reduced, it is ſcarce poſſible but there muſt follow violent Convulſions, Inflammations, *Sphacelus*,

celus, and Death itſelf, merely from the vehement Diſtenſion of the Ligaments: But when the Bone is gradually thruſt out of its Place from internal Cauſes, then there is ſcarce any Uneaſineſs perceived. In the mean time, to make a more ready Diſcovery of Diſlocations in general, it may be very proper to have in readineſs an univerſal Rule, *viz. That whenever the Head of any Bone is removed out of its Place, its other End will be diſtorted in an oppoſite Direction*; when the upper End of a Bone is thruſt inward, its lower one will ſtand outwards, and when the firſt is outwards the latter will be bent inwards.

The Signs proper to particular Luxations.

XV. Though theſe common Signs of Luxations, with a Knowledge in the Mode of each Articulation, may be generally ſufficient to diſcover moſt Diſlocations; yet we ought not to be ignorant of ſeveral other Signs which are proper to ſome Luxations only. Thus in a Diſlocation of the lower Jaw, the Mouth gapes open and cannot be ſhut by the Patient. When one *Vertebra* is puſhed over another, all the Parts beneath it are deprived of Senſe and Motion: For none of the *Vertebræ* can be diſlocated in any manner, without compreſſing or wounding the *Medulla*, which is tranſmitted through their middle, in conſequence of which the Courſe of the Spirits through it and its Nerves to the lower Parts, will be either diſturbed or wholly intercepted. When one of the Ribs are diſlocated, the Breath is very difficult to be drawn, and other bad Symptoms of the like kind ariſe. But to open at large the peculiar Signs of every other Luxation, is not the Buſineſs of this Place: Eſpecially as they may be readily deduced from the Action of each particular Part where they happen.

Signs of imperfect Luxations.

XVI. A Subluxation or Strain may be diſcovered, when the Patient has ſuffered under ſome great external Violence, and the particular Joint is afflicted with Immobility and violent Pains, the natural Figure or Poſition of the ſame being little or nothing changed. But however, upon a more ſtrict Examination of the Part affected, there may be almoſt always found ſome little Inequality in the Articulation or Limb.

Signs of Luxations from internal Cauſes.

XVII. Laſtly, Luxations which proceed from internal Cauſes may be known from the following evident Signs: (1.) The Limb is ſo much relaxed as to be eaſily turned about in any Direction: (2.) There will be a Cavity about the Place of the Articulation, and the Fingers will perceive a Hollowneſs upon preſſing them between the Bones: (3.) The Bone that has ſlipped out may be eaſily replaced, but then it ſoon falls out again of itſelf; ſo great is the Weakneſs of the Ligaments and Muſcles, that they are not able to keep the Bone in its right Place: Hence, (4.) the diſlocated Limb will be longer than the ſound one: It is alſo (5.) generally not accompanied with any Pain, Inflammation, or Convulſion, as is uſual in other Luxations: Laſtly, (6.) from the Seat of this Luxation, being generally in the upper Joint of the Thigh or Arm, and ſometimes in the Articulation of the Foot with the *Tibia*.

The *Prognoſis* of Luxations.

XVIII. If any Surgeon deſires to be well ſkilled in the *Diagnoſis* and *Prognoſis* of Luxations, I adviſe him to be well verſed in the Structure and Difference of the Parts affected, as well as to compare the Caſe carefully with the ſeveral Cauſes and other Circumſtances of Luxations. For thus we find that *imperfect* and *ſimple* Luxations are reduced with much more Eaſe, and treated with much greater Succeſs than ſuch as are attended with Wounds, Fractures, Convulſions, Inflammations, or the like. The Reduction is not only more difficult in Proportion to the number of Accidents or Symptoms, but alſo as the

Bones are more or less distant and separated from each other; insomuch that the Bones cannot often be replaced, by reason of the Fracture and great Inflammation; or if they are once reduced, it is very difficult to retain them in their Places, and perfect the Cure without Lameness, from the great Weakness of the Ligaments; which last is usually the more certain in Luxations from internal Causes. But in Luxations that happen from internal Causes in very young Subjects, the lower Part of the Limb generally wastes, and becomes altogether weak and flaccid. Luxations that have just happened, are in the general much easier and sooner cured than those of long standing; for in the latter there generally arises Tumor with Inflammation, and the Juices gather in great Quantity, by which means the Ligaments are extremely relaxed, or the Articulation so glued up and obstructed, that it cannot receive the Head of the Bone as before; nor is it unusual for the Head of the dislocated Bone, in an inveterate Luxation, to lodge itself in some new *Sinus*, on one Side its natural one; by which means the Head of the Thigh Bone has adhered and grown to the external Part of those of the Hips, or else to its *Acetabulum*; that Cavity itself being filled up with some preternatural and tenacious Juice.

Luxations in Infants.

XIX. If any Bone be dislocated in Infants, or separated from some *Epiphysis*, the Case is very dangerous, and usually attended with very bad Consequences: For (1.) the Head of the very soft and cartilaginous Bone is so distorted as to be seldom if ever reducible to its natural Figure: (2. These kinds of Luxations are usually concealed by Maids and Nurses, so that they do not come under the Care of the Parents or Surgeon till it is too late: (3.) It may happen that the Surgeon, ignorant of the true Cause, will take it to be and treat it as proceeding from a Flux of Humours, often too violently extending those soft and now cartilaginous Parts, and throwing them into some very bad Posture. Lastly, (4.) Want of Skill in the Surgeon may be an Occasion of the Bones not being happily replaced in Infants; for nothing is more improper than the violent Distension some Surgeons use in these Cases, whereby they separate those soft Bones and their *Epiphyses* more from each other, and occasion many bad Symptoms.

CHAP. II.

Concerning the CURE *of Luxated Bones.*

The Cure of Luxations.

I. THE Method of treating Luxations of the Bones does pretty much agree with and is in a great measure the same with that used in Fractures. For in Dislocations as in Fractures, the whole Design of the Surgeon is, (1.) To restore the luxated Bone to its Place, first by Extension, and then by Reduction with his Hands; (2.) To preserve and retain what is so replaced, in their natural Position: And lastly, (3.) To prevent and cure the several Symptoms which usually attend. The Reduction is used to be commodiously performed by placing the Patient on a Stool, Table, Bed, or the Ground, as the Surgeon shall think most suitable to the Case. It is however to be observed here, that those Luxations are most readily reduced on a Stool, which happen in the Jaw, Clavicle, Arm, or Hand; on a Table, such as happen in the

the *Vertebræ* or Thighs; on a Bed, ſuch as happen in the Legs or Feet; and laſtly, thoſe Diſlocations are moſt commodiouſly reduced on the Floor which happen on the Shoulders or *Vertebræ* of the Neck.

Of (1.) the Extenſion.

II. The Extenſion, as we obſerved, in diſlocated Bones, is to be made much after the ſame manner as in Fractures; *viz.* the outer or lower Part of the diſlocated Limb is to be extended by an Aſſiſtant, till the Head of the diſorder'd Bone be found to correſpond exactly with the *Sinus* from whence it was luxated. This may be done by the Hands; but, if they are not ſo convenient, the Extenſion ſeldom fails of being made ſo well by a Napkin, as to render the Machinery delineated in ſuch an ample manner by ORIBASIUS, PAREY, ANDREAS A CRUCE, SCULTETUS, and others, generally unneceſſary; ſince they can effect ſcarce any thing more, unleſs it be to terrify and diſcourage the Patient in the Extenſion, by their formidable Shew.

Of (2.) the Reduction.

III. To replace the luxated Bone again in its natural Seat, the Surgeon muſt regulate the Aſſiſtant's Extenſion, by ordering it to be ſtrong enough, and in a right Direction; in the mean time he is to compreſs the Articulation gently with his Hands and Fingers, till he find the elapſed Bone recover its right Place.

How to know when the Bones are rightly replaced.

IV. An accurate Reduction of a Luxation is known to have been effected by the ſame Signs which have been before mentioned in the Doctrine of Fractures. It is a good Sign, (1.) if the Bone be heard to ſnap or crack in its Reduction; (2.) when the diſorder'd Limb is found to be of the ſame Length with the ſound one; (3.) when the Pains grow leſs; or laſtly, (4.) when the Limb can perform its uſual Motion.

The Reduction is often to be delayed.

V. But as Fractures are often prevented from being directly ſet by being attended with Inflammation, Hæmorrhage, or Tumor; ſo alſo Luxations often cannot be ſafely reduced before thoſe impeding Symptoms are firſt removed by a proper Treatment. (*See Book* II. *Chap.* II. §. 11.) In ſuch Caſes alſo where the Luxation is accompanied with a Fracture, the Reduction muſt be put off till that is firſt ſet and joined; for the Extenſion cannot be ſafely attempted till the Fracture be well joined by a firm *Callus*.

How the luxated Limb is to be treated after Reduction.

VI. After the Bones have been puſhed into their Places from whence they were forced out, the next Buſineſs is carefully to retain them there. But Bones that are entire are much eaſier retained than thoſe that have been broken; for the latter cannot be contained in their right Poſture without ſtrict Bandage and Reſt; whereas there is in the firſt Caſe ſeldom much Occaſion for Bandage, or any great Reſt: For thus in freſh Diſlocations of the Jaw, Bones of the Fingers, Hands, *Cubitus*, and *Humerus*, the Bone may be immediately reduced without further Bandage or Reſt; becauſe they are generally held firm enough by their proper Ligaments and Muſcles. It ſeems rather more neceſſary to bend, extend, and gently move the Limb ſometimes, than to endanger its becoming ſtiff and immoveable by a long Inactivity. But when the Luxation happens in the lower Extremities, it ſeems better to let the Patient reſt a few Days in his Bed, moving the Limb gently as ſoon as he finds it capable, and afterwards he may riſe and walk cautiouſly with it.

Of an inveterate Luxation.

VII. On the other Hand, when the Ligaments have been much ſtretched by a violent and long continued Diſtenſion, or have been render'd infirm by any other means, it ſeems altogether neceſſary to make uſe of ſome proper Bandage, and

and to recommend Reſt to the Patient, till the Ligaments have regained their former Strength. But here it muſt be alſo carefully obſerved, to let the diſorder'd Articulation ſometimes have a little gentle Motion, by an eaſy Flexion and Extenſion of the Limb, to prevent any Stiffneſs or other bad Conſequence from ſuch a continued Reſt. In the mean time it may not be improper to moiſten the Bandages and bathe the Part well with *Sp. Vin. Aq. Hungar.* or ſome other warm and ſtrengthening Spirit, by which means the Ligaments are uſed to become very firm and ſtrong. The Bandages themſelves ſhould be neither too tight nor too looſe; the Reaſon for which, we have given in *Book* II. *Chap.* I. §. 34. treating on Fractures. As for the Application of Plaſters, which has been ſuch a prevailing Cuſtom in theſe Caſes, they may be altogether omitted here, as in Fractures, without any Danger; they ſeem even to do more Service by their Abſence than Preſence.

Of the Symptoms of Luxations.

VIII. The Inflammations, Tumors, Pains, Convulſions, Hæmorrhages, and other ſuch Symptoms which happen before or after the Reduction of a Luxation, are to be treated and cured in the ſame Method with that we preſcribed before in the Cure of Wounds and Fractures, *Book* I. *Chap.* II. §. 17, 18. *Book* II. *Chap.* II. §. 1. But as ſoon as the Bones are replaced, the fore-mentioned Symptoms generally vaniſh, by degrees, of themſelves. When the Ligaments are very much weakened, it is extremely uſeful to bathe the Part, after it has been firſt well rubbed with hot Linen Cloths, with highly rectified Spirit of Wine ſet on fire, uſing plentifully afterwards ſome ſtrengthening Spirit, (as at *Book* II. *Chap.* II. §. 9.) and then binding it up with a proper Bandage. But if violent Pains ſhould remain notwithſtanding the Luxation be reduced, there is Reaſon to fear that there is a Fracture along with it. We muſt therefore endeavour to be ſatisfied with regard to this Certainty, and if we find a Fracture we muſt uſe our Endeavours to ſet it: If a ſlight Fever ſhould attend, Bleeding, a thin Diet, and cooling Medicines are to be uſed: If a Gangrene ſhould appear, which may ſometimes happen, it muſt be treated not only with the Medicines which we have before recommended, but alſo with Fomentations and digeſtive Cataplaſms, binding up with the eighteen-headed Bandage. For the reſt of the Symptoms, they may be treated as we propoſed *Book* II. *Chap.* II. always taking Care to let the Diſlocation be reduced firſt. If a Luxation ſhould be attended with a Wound, we muſt make uſe of the eighteen-headed Bandage, and proceed with the reſt as we have directed in Hæmorrhages, *Book* II. *Chap.* II. in the Doctrine of Wounds. If an Abſceſs ſhould be formed, it will be much the beſt to open it as ſoon as ever we find it to be ripe: For elſe there will be Danger leſt by the long ſtay of the Matter, it ſhould corrode the Articulation and Bones, and produce the worſt kind of *Fiſtulæ*, which are often to be remedied by no means but that of amputating the Limb. When the Bones are diſlocated with ſo much Violence as to break and deſtroy the Ligaments, Tendons, and adjacent Skin; the Caſe is then, as HIPPOCRATES has obſerved, altogether incurable: For the more we ſtrive to replace them, the leſs Inclination have they to join again firmly, and by exciting Convulſions and a Gangrene, take off the Patient: Therefore whenever Luxations are attended with ſuch grievous Accidents as are certainly deſperate, if we would preſerve the Life of the Patient, we muſt of neceſſity ſpeedily take the Member entirely off. If the Luxation is attended with a Fracture, then the Luxation muſt

muſt be reduced firſt, if poſſible, and the Fracture is to be ſet afterwards. But when this cannot be done, it will be proper to have Recourſe to what we have before obſerved on Fractures, *Book* II. *Chap.* II. §. 11. Laſtly, if any Joint ſhould become ſtiff and immoveable, it will be proper to treat it in the manner mentioned near the Place now cited.

CHAP. III.

Of LUXATIONS *in particular; and on thoſe of the Head and Noſe.*

I. HAVING treated of Luxations in general, it remains that we conſider each particular Luxation by itſelf; we ſhall therefore begin firſt with thoſe of the Head, and then deſcend to the reſt, as we did in expounding the Doctrine of Fractures. There are not wanting ſome who deem it a Luxation of the Head, when the Bones of the *Cranium* are ſeparated any diſtance from each other; whether it proceeds from an *Hydrocephalus* in Infants, or from violent Head-achs, or ardent Fevers in Adults. But there is no room for us here to treat more largely on theſe Luxations. The Method of treating the firſt, we ſhall deliver when we come to conſider the *Hydrocephalus*: But as the other very ſeldom, if ever, happens, it ſeems to be curable by no other Method than that of Bandage and Compreſſion. Diſlocations of the Head.

II. It ſometimes, tho' not often, happens that the Bones of the Noſe are ſeparated from each other, or diſtorted out of their natural Places by ſome violent Blow or Fall. When ſuch an Accident happens, it is ſeveral ways diſcoverable; as, (1.) by the Sight, when we behold the deformed Poſition of the Noſe; or, (2.) by Feeling; or, laſtly, (3.) by the Ear, when we perceive with what Difficulty the Patient draws his Breath thro' his Noſtrils. But as we before obſerved, theſe Luxations do but ſeldom happen; for the Bones of the Noſe are ſo firmly connected to the *Os Frontis* and other Bones, that they will ſooner break than ſeparate from each other. Luxation of the Noſe.

III. When this Caſe happens, the Patient is to be ſpeedily placed in a high Chair, that an Aſſiſtant may ſtand behind and hold his Head firm, in a proper Poſture. The Surgeon is then to introduce with one Hand, a thick Probe, a Gooſe Quill, or little Stick ſhaped for the Purpoſe, up the Noſtril internally, by which means the depreſſed Parts of the Noſe may be thruſt into their Places: In the mean time he applies his other Hand externally, to guide and direct the Parts which are moved from within. This being done, there is ſcarce any thing elſe required but to let a Bit of ſticking Plaſter lie upon the Noſe for ſome time: But if any thing ſhould occaſion a Wound in the Noſe at the ſame time, the Cure muſt be carried on in the way which we propoſed before under a Fracture of the Noſe. Cure of a luxated Noſe.

CHAP.

CHAP. IV.

Of a DISLOCATION *of the Lower Jaw.*

How the Jaw may be luxated.

I. THE Lower Jaw is indeed ſeldom luxated, becauſe it is held ſo firm by ſtrong Ligaments and Muſcles, by whoſe Aſſiſtance it is retained in two *Sinuſes* in the Baſis of the *Cranium*. But when it is by Accident forced out from thence, it may chance to be on one Side only, or elſe on both, it being then thruſt directly forwards. And this happens moſt frequently from opening the Mouth too wide in yawning; tho' it has ſometimes been occaſioned by a violent Blow or Fall. If it be luxated on both Sides, the Chin will incline downward, and the Jaw will be thruſt very forward; but if only on one Side, the Chin will be inclined toward the oppoſite Side; the elapſed little Head of the Jaw not being capable of Diſlocation but forward and inward: For the Proceſſes of the Bones of the *Cranium* prevent the Jaw from being diſlocated backwards: So that it ſeems a little ſtrange that any one ſhould aſſert, contrary to the common Obſervations and Writings of the beſt Practitioners, that the Lower Jaw may be luxated backwards as well as forwards. This is ſo inconſiſtent, that tho' he ſhould confirm his Opinion by Examples and Obſervations, it muſt be looked upon as the Conſequence of ſome Difference in the Articulation from what is uſual in Nature.

How to diſcover a Luxation of the Lower Jaw.

II. The Lower Jaw is chiefly known to be luxated on one Side when the Chin is diſtorted on the oppoſite Side; for that Part to which the Chin inclines, is the ſound; but that from whence it recedes is the luxated one: The Mouth in this Caſe gapes wider than uſual, ſo that the Patient cannot ſhut it, nor eat with his Teeth; the lower Range of Teeth being projected beyond and on one Side the Upper. But when the Jaw is luxated on both Sides, then the Mouth not only gapes wide open, but the Chin alſo hangs down, and is thrown directly forwards; ſo that it is no wonder if the Patient cannot ſhut his Mouth, ſpeak diſtinctly, or even ſwallow any thing without much Difficulty.

Prognoſis.

III. When the Jaw is out only on one Side, the Cure is uſually not ſo very difficult; but when both Heads are diſlocated, and not preſently reſtored to their Places, it always occaſions the worſt of Symptoms, as Pains, Inflammations, Convulſions, Fevers, Vomitings, and at length, as HIPPOCRATES obſerves, Death itſelf comes on: And theſe Symptoms are the more violent, as the adjacent Nerves, Tendons, and Ligaments ſuffer a greater Extenſion. But if an expert Surgeon comes in time, the Luxation is not very difficult to reduce.

Cure.

IV. When this kind of Luxation happens, the Patient is to be directly ſeated on a low Stool, ſo that an Aſſiſtant may hold his Head firm back againſt his Breaſt; then the Surgeon is to thruſt his two Thumbs as far back into the Patient's Mouth as he well can; but they are to be firſt wrapped round in a Handkerchief, to prevent them from ſlipping or being hurt; and his other Fingers are to be applied to the Jaw externally: When he has got firm hold of the Jaw, it is to be ſtrongly preſſed, firſt downwards, then backwards, and laſtly upwards, but ſo as that they may be all done in one inſtant; by which means, the elapſed Heads of the Jaw may be very eaſily ſhoved into their former Cavities: But the Surgeon ought to be always careful to ſnatch his Thumbs quickly out of the Patient's

Patient's Mouth, leſt they ſhould be compreſſed, bruiſed, or bit, by reducing the Jaw into its Place.

V. If the Jaw be out on one Side only, every thing muſt be done in the ſame manner; but the luxated Side of the Jaw muſt be forced more ſtrongly downward and backward than the ſound one. Some ſay this Luxation may be ſometimes very readily reduced by a violent Stroke on the oppoſite Side of the Jaw; but this is a Method too pleaſant to be uſed with Safety in moſt Patients. As for Bandages there ſeems to be no great Occaſion for them in this Caſe, unleſs the Luxation has remained ſome time before it was reduced; for then it may be not improper to apply for ſeveral Days the four-headed Bandage, with ſome ſtrengthening Spirit, which may be taken off when the Patient intends to eat. Of the Jaw luxated on one Side.

CHAP. V.

Of LUXATIONS *of the Head and Spine.*

I. THE Luxations which happen in the *Spine* and *Vertebræ* of the Back are generally imperfect ones: For it appears from an accurate Conſideration of the Structure and Articulation of theſe Bones, that none of the *Vertebræ* can be entirely diſplaced without being fractured, and alſo compreſſing or wounding the Spinal Marrow, which muſt produce Danger of inſtant Death. Even the imperfect Luxations of theſe Bones are very dangerous; which happen either between the two ſuperior *Vertebræ* of the Neck and the Head, or elſe between the reſt of the *Vertebræ*, when they happen to be forced from each other. How the *Vertebræ* may be luxated.

II. Such as have a Luxation between the Head and upper *Vertebra*, ſeldom eſcape being carried off by a ſpeedy and ſudden Death: For in this Caſe the tender *Medulla* which joins immediately with the Brain, and is lodged in the Spine, the Brain itſelf, and the Nerves which ariſe beneath the *Occiput*, are too much diſtended, compreſſed, or lacerated. The two condyloide Proceſſes of the *Occiput* uſually ſlip out of their glenoide *Sinus*'s in the firſt *Vertebra* of the Neck, when a Perſon falls headlong from a high Place, from off a Ladder, from on Horſeback, or when he receives a violent Blow upon his Neck; they dying very ſuddenly in this Caſe, are vulgarly ſaid to have *broke their Neck*, though there is generally no more than a Luxation; yet it ſometimes happens that the *Vertebræ* of the Neck are really fractured: If Life ſhould remain after ſuch a Luxation, which very rarely happens, the Patient's Head is commonly diſtorted with his Chin cloſe down to his Breaſt, ſo that he can neither ſwallow any thing, nor ſpeak, nor even move any Part that is below his Neck; therefore if ſpeedy Aſſiſtance be not had, Death enſues, from the Compreſſure or Hurt of the *Medulla*. Luxation of the Head.

III. But to repulſe this unwelcome Meſſenger, the Patient is to be immediately laid flat upon the Ground or Floor, then the Surgeon kneeling down with his Knees againſt the Patient's Shoulders, is to bring them together ſo as to contain the Patient's Neck between them; this done, he quickly lays hold of the Patient's Head with both his Hands, and ſtrongly pulling or extending it, he gently moves it from one Side to the other, till he finds by a Noiſe, the natural How the Head is to be replaced.

tural Poſture of the Neck, and the Remiſſion of the Symptoms, that the Diſlocation is properly reduced. By this Method the Surgeon retains the Patient firm between his Knees, and performs the Extenſion and Reduction with his Hands.

Another Method of Reduction.

IV. The ſame may be effected by another Method much like the former, as when the Patient ſits upon the Ground, his Shoulders being preſſed down, and his Head laid hold of under the Ears, and pulled ſtrongly but cautiouſly upwards, inclining it a little to each Side, till the Signs enumerated before (at §. 3.) demonſtrate it to be reſtored to its natural Place. If any of the other *Vertebræ* of the Neck ſhould be diſlocated, the Reduction is to be made in the ſame manner; therefore there is no occaſion to give them here a ſeparate treatment.

PETIT's Method of Reduction.

V. But M. PETIT (*Lib. de Morb. Oſſ.*) rejecting the former Methods, has taught us another way of reſtoring a Luxation of the Head, though he does not mention that he ever uſed it. He forms two Slings, having a large opening about their middle, as is delineated in *Tab.* X. *Fig.* 1, 2. The Patient lying on his Back, he takes the Sling *Fig.* 1. and puts his Head through the opening B, which is made purpoſely large enough, and proportionable to the Size of the Head; the Part of the Sling A comes under the Patient's Chin, the Part B is placed under the *Occiput*, and the two Extremities of the Loop CC, come up over his Ears, the Ends D and E being the Parts by which the Extenſion is made: But to hold the Patient firm, he recommends another Sling *Fig.* 2. through whoſe opening F, the Head is tranſmitted ſo as to make the Part of the Sling G come down his Back, and the Part H to come over his Breaſt, the two Extremities of the Sling I I, are to be joined together between the Thighs, and by this means the Body is to be held from giving way to the Extenſion made by the other; while the Head and *Vertebræ* of the Neck are kept ſufficiently extended by pulling theſe Slings in oppoſite Directions, the Surgeon endeavours to replace the luxated Bones. But, to ſay truth, the preceding Methods ſeem to me to have the Preference; partly becauſe they are more ſimple and performed without any Aſſiſtants or other Inſtruments than the Hands, which former are not always to be had; and partly becauſe the Patient may be relieved much ſooner by theſe means, for while the Machinery is fetching or adapting, the Patient will, in all Probability, be dead. PETIT lays down no other Method of reducing this Luxation, throughout his whole Book, than this by his Slings, not even how to aſſiſt the Patient in ſuch Caſes; whereas the Accident may happen very often in the Country, where ſuch Slings and Aſſiſtants cannot be had to help the Patient. In the mean time a Napkin or long Slip of Linen of two or three Hands breadth, ſlit to let the Patient's Head through, will make a good Subſtitute for theſe Slings when they are not at hand.

What is to be further done.

VI. But after any of the *Vertebræ* are replaced by any Method, it will be proper, in order to prevent Tumor, and reſtore the ſtretched Ligaments of the Neck to their former Vigour, to bathe it with *Aq. Hungar. Sp. Vin. Camph.* or ſome other ſtrengthening Spirit applied warm, as alſo Compreſſes dipped in the ſame; the Patient is laſtly to be ordered to reſt gently for ſome Days, till the Neck be found ſufficiently ſtrong and well. As for Bandages, there ſeems to be little occaſion for them here, unleſs it be ſuch as are deſigned to keep on the Compreſſes, dipped in ſome ſtrengthening Spirit.

VII. With

VII. With reſpect to the reſt of the *Vertebræ* of the Back, they are ſeldom moved quite out of their Places, unleſs they are fractured, they being retained for the greateſt Part, by adhering to the adjacent Ligaments and Muſcles; and therefore the Luxations which happen among them are uſually imperfect; no more being diſplaced than their two upper or lower Proceſſes, and they often but on one Side: And this happens ſometimes to one of the Spinal *Vertebræ*, and ſometimes to more. But it is here to be briefly obſerved, that it is uſual to include among the number of luxated *Vertebræ*, that which is ſound and firm, but intercepted by others which are not ſo: Thus whenever the upper *Vertebra* of the Loins from the laſt of the Back, and lowermoſt *Vertebra* of the Loins next the *Os Sacrum* are luxated, we commonly ſay and reckon there are five *Vertebræ* out of their Places; when, ſtrictly ſpeaking, only the two outermoſt or the uppermoſt and lowermoſt of thoſe *Vertebræ* are diſturbed; the three middle ones retaining their natural Situation and Connection. Of Luxations in the other *Vertebræ* of the Back.

VIII. If any one cloſely conſiders the natural Structure and Connection of theſe Bones, it will pretty evidently appear, that the Spinal *Vertebræ* are not to be luxated but by ſome very conſiderable Violence: For beſides their being moſt cloſely joined to each other by means of *Proceſſes* or *Apophyſes*, they are tied together and connected very firmly by exceeding ſtrong Ligaments and Cartilages. And this is the reaſon why the Spinal *Vertebræ* are not luxated, without thoſe Cartilages and Ligaments ſhould break, in violently bending the Back, or in receiving ſome great Blow or Fall thereon: For theſe Cauſes are generally ſo far from ſeparating them, that they drive them more cloſely together. But if by Accident this ſhould happen from ſome very great Violence, it ſhatters the Spinal *Vertebræ* and their *Medulla*, and quickly kills the Patient, as I myſelf have ſometimes ſeen: Therefore whenever a *Vertebra* is luxated without being fractured, the Body muſt of neceſſity incline ſtrongly forwards or on one Side; for in this Caſe, the ſuperior Proceſſes of the *Vertebræ*, by which they are faſtened to each other, will be ſeparated from the inferior Proceſſes; by which means the *Vertebræ* will be diſpoſed to be eaſily removed from each other; and they will incline towards the right Side when the Hurt is on the left, and the contrary. How Luxations of the Spinal *Vertebræ* can happen.

IX. The Signs common to Luxations in the *Spina Dorſi* are chiefly the following: The Back itſelf is found to be crooked or unequal, after the external Violence has been inflicted; the Patient can neither ſtand nor walk, and his whole Body ſeems to be paralytic; the Parts which are beneath the luxated *Vertebra* are nearly without all Senſe and Motion; the Excrements and Urine cannot be diſcharged, or elſe they are ſometimes emitted involuntarily; the lower Extremities grow dead by degrees, and, at length, Death itſelf follows. But theſe Symptoms vary in proportion to the degree of Violence in the Luxation; for the more Diſorder the *Spina Dorſi* undergoes, the more grievous and dangerous will be the conſequent Symptoms. The common Signs of Luxations in the *Vertebræ*.

X. But what number of the Spinal *Vertebræ* are luxated, muſt be judged of by the degree of that preternatural Incurvation; for where there is but one *Vertebra* luxated, the Curvature is gibbous, making a ſort of Angle; if the Proceſſes of the *Vertebræ* are diſplaced forwards, then the *Spina Dorſi* will ſeem to bend inwards, and the Patient will always have violent Pains upon bending his Body; on the contrary, when he lies upon his Back, the Pains will be more gentle. If the *Vertebra* is luxated on the right Side, the Body may be obſerved to The particular or proper Signs.

incline towards the left, and it will be eaſier bent on the right than left Side: If the *Vertebra* be luxated on the left Side, the contrary of all theſe Appearances uſually follow.

Prognoſis. XI. If any one be deſirous to preſage the dubious Events of Luxation in the *Vertebræ*, I would have him remember that theſe Caſes are generally very dangerous and uncertain; and that even when the *Medulla* is neither contuſed nor wounded, but from the difficulty of reducing the luxated *Vertebræ*: And the more the *Vertebræ* are diſplaced, the more will the *Medulla* be injured, the worſe will be the Symptoms that ariſe, and the more precipitate will be the Patient's End. The nearer the luxated *Vertebra* is to the Head, the greater and more extenſive is the conſequent Danger: For as Injuries are the eaſieſt to be inflicted upon the *Medulla* in thoſe Parts, ſo they are always of the worſt Conſequence; therefore Luxations in the Neck are always more pernicious than thoſe which happen in the Back, and thoſe in the Back are much worſe than thoſe which happen in the Loins; and what may ſeem wonderful is, that the Symptoms appear much milder in Caſes where ſeveral *Vertebræ* are luxated, than they do when there is only one; and ſtill much milder when the Proceſſes on both Sides are diſplaced, than when only one of them are luxated: For in the latter of theſe Caſes, the *Medulla* is more compreſſed upon a leſs Space, as will appear evident to ſuch as carefully conſider the Structure of the *Spina Dorſi*: But then in ſlight Luxations the *Vertebræ* may be more eaſily replaced, and therefore Men may be often in leſs Danger of Death on that account.

Cure. XII. To make the Caſe no better than it is, Luxations of the Spinal *Vertebræ* are in general very difficult to reduce. The Artifices uſed by the Ancients were ſo foreign and unadequate to the Caſe, that they ſeem to have been uſed to no Purpoſe, proving rather a Torture than a Remedy. The following ſeems to be the moſt ſuitable Method of reducing Luxations of the *Vertebræ*: When the *Apophyſes* of the *Vertebræ* are diſlocated on both Sides, the Patient is to be laid leaning upon his Belly over a Caſk, Drum, or ſome other gibbous Body; and then two Aſſiſtants are ſtrongly to preſs down both the Ends of the luxated Spine, on each Side; by which means the Bones of the Spine will be ſet free from each other, lifted or puſhed up in the Form of an Arch, and ſo gradually extended; this done, the Surgeon preſſes down the luxated *Vertebræ*, and at the ſame time nimbly puſhes the ſuperior Part of the Body upwards; and by this means the luxated *Vertebræ* are ſometimes commodiouſly reduced into their right Places: But if Succeſs ſhould not attend the firſt time, the Method ſhould be repeated two or three times more. PETIT lays a thick Cloth rolled up like a Cylinder acroſs upon the Bed, and placing the Patient over it, treats him in the ſame method which we juſt now propoſed. When the *Vertebra* comes out on one Side, the Patient is then to be placed inclining in the prone Poſture now mentioned; but ſo that, when the left *Apophyſis* is diſplaced, one Aſſiſtant may preſs the lower *Vertebræ* inwards to the right, and another Aſſiſtant may depreſs the right *Humerus*, *& vice verſâ*: For if there be any convenient method of reducing the Spinal *Vertebræ* when luxated, there can ſcarce be any more commodious than that here propoſed. And from hence, I ſee, it will appear evident, that the generality of thoſe Slings, Bandages, Pulleys, Levers, and other Inſtruments, which the ancient Surgeons uſed to faſten about the Patient's Hips, Shoulders, and Breaſt, and are to be ſeen figured and deſcribed in ORIBASIUS, PAREY,

Parey, and Sculterus must be on every hand allowed to be so far from suitable for reducing these Luxations, that they must be generally pernicious. For the remainder, it seems proper, after the *Vertebræ* are reduced, to bathe the Spine with *Spir. Vin.* or to lay on Compresses dipped in *Sp. Vin. Camph.* and to bind the Parts up with the *Napkin-and-Scapulary:* Afterwards the Patient is to be laid in a soft and even Bed; bleeding and bathing the weak Parts with strengthening Spirits, are to be used as there may be occasion; the Bandage must be very seldom taken off, and all the Symptoms which happen in these Luxations are to be palliated as usual, till the Cure is perfect.

CHAP. VI.

Of Luxations *of the* Os Coccyx, *Ribs, and Clavicles.*

I. THE *Os Coccyx* may be thrust inwards by a violent Fall or Blow, and it is often pushed outwards in hard Birth. When this happens, it is usually attended by violent Pain and Inflammation about the lower Part of the Spine, Abscesses form in the *Intestinum Rectum*, and the *Fæces* are constipated or suppressed. To discover the Luxation of this Bone the more readily, we have recourse to the use of our Hands and Eyes, as well as to the knowledge of the forementioned Symptoms. Nor is the replacing this Bone very difficult, if attempted by a careful and expert Surgeon: For if it be thrust outwards, it must be depressed into its right Place by the Thumb; after which may be applied Compresses dipped in warm Wine or its Spirit, made broad above and narrow below, to fill up the posterior *Sinus* of the *Nates*; and these may be held on by the T Bandage of Heliodorus, *Tab.* II. *Fig.* h. But that Part of this Bandage which comes between the Thighs, should be slit and placed so that the Patient may go to stool without undoing the Bandage, and to prevent the Bone from being by that means displaced again. A Luxation of the *Os Coccyx* outwards.

II. When the *Os Coccyx* happens to be luxated inwards, the first Finger is to be introduced into the *Anus*; after it has had its Nail cut and been dipped in Oil, it must be thrust as far as possible, that it may the more readily drive out the depressed Bone; the other Fingers being applied externally, are to conduct the Bone into its right Posture. When this has been done, it will be proper for the Patient to rest some time upon the Bed, and when he sits up, it should be in a Chair with a Hole in its Bottom, lest the affected Part should be otherwise compressed or disturbed. Luxation of the *Os Coccyx* inwards.

III. The Ribs are indeed sometimes, tho' but seldom, dislocated: For upon the Assault of some external Violence, it is not uncommon for them to be displaced, either upwards, downwards, inwards, or outwards. They cannot be easily luxated outwards, because prevented by the Vertebral Processes, and resisted by very thick and strong Muscles. But when they are drove into the Cavity of the *Thorax*, they not only lacerate the *Pleura* or Membrane which lines the Cavity of the *Thorax*, but do generally great Injury to the contained Parts: In consequence whereof arise most sharp Pains, Inflammation, Difficulty of Breathing, Cough, Ulcers, Immobility, and many other dangerous Symptoms of the like nature. But by what Signs such Dislocations of the Ribs are to be disco- Luxations of the Ribs.

discovered, there is no occasion to consider here at large; since the external Form and Posture of the Side, with the troublesome Symptoms now enumerated, generally afford evident Demonstration whether any and on which Side the Ribs are luxated.

How the Ribs are to be reduced, when luxated upward or downward.

IV. The more numerous and grievous the consequent Symptoms are, the greater is the Danger, and the more speedily should the Luxation be reduced. When the Rib is dislocated either upwards or downwards, in order to replace it conveniently, the Patient is to be laid on his Belly upon a Table, and the Surgeon must strive to reduce the luxated Rib into its right Place with his Hands; or the Arm of the disordered Side may be suspended over a Gate or Ladder, as is shewn by Figures in PAREY and SCULTETUS, and while the Ribs are thus stretched up from each other, the Heads of such as are luxated may be pushed into their former Seat.

How the Ribs are to be reduced, when luxated internally.

V. But those Luxations wherein the Heads of the Ribs are forced into the *Thorax* are generally found to be much the most difficult to reduce, since neither the Hand or any other Instrument can be applied internally to direct the luxated Heads of the Ribs. But notwithstanding there are many eminent Surgeons who pronounce this Case to be wholly incurable, yet, in my Opinion, we ought not to despair of being frequently successful: In this Case it seems proper to lay the Patient on his Belly over some gibbous or cylindric Body, and to move the Forepart of the Rib inwards towards the Back, shaking it sometimes: For thus it sometimes happens that the Head of the luxated Rib slips into its former Place. But if this method of Cure will awail nothing, and the deplorable Condition of the Patient requires speedy Help, we have no Remedy left but Incision, and endeavouring to replace the luxated Head of the Rib with the Fingers, Plyers, or little Hooks, after the same manner which we proposed before in Fractures of the Ribs, in *Book* I. *Chap.* X. §. 8, *& seq.* In the mean time, where the Symptoms are not very urgent, and the Heads of the Ribs but little displaced, it is adviseable neither to incise the Flesh, nor violently force the Ribs; because there are several Instances where the luxated Ribs have retained their dislocated Stations without any Hurt: But above all, Care must be taken to lay on a Compress dipped in warm *Sp. Vin.* or *Sp. Vin. Camph.* to be retained on the afflicted Part of the Side by the *Napkin-and-Scapulary.*

Luxations of the Clavicles.

VI. Though the Clavicles are sometimes displaced, it is but seldom, by reason of their strong Ligaments. They may be dislocated either from the Top of the *Sternum* or *Processus Acromion* of the *Scapula*, to which they are connected, by some external Violence, as a Fall, Blow, the lifting some great Weight, or the like. With regard to the Cure, the sooner Assistance is had to the Patient, the more easily may the Reduction of the Clavicle be performed; but when the first is delayed, the latter will be the more difficult, insomuch that inveterate Luxations of the Clavicles are generally found incurable.

(1.) near the *Sternum.*

VII. The Clavicles may be dislocated in two manners from the *Sternum*, either internally towards the *Larynx*, or externally upon the Breast. When the first Case happens, a Cavity may be generally observed upon the Part affected, and the *Trachea* with the Carotid Arteries, Nerves, and *Oesophagus*, which are all together, will be very much disturbed and compressed: On the contrary, when it is luxated forwards upon the Breast, it shews itself by a preternatural Tumor, instead of a Cavity, upon that Part.

VIII. In

VIII. In what manner the luxated Clavicles may and ought to be extended and reduced again into their natural Places, has no Buſineſs to be inſerted again in this Place; becauſe every thing is to be obſerved the ſame as we propoſed in reducing Fractures of the Clavicles, *Book* II. *Chap.* V. §. 4. But this muſt be particularly regarded, to carefully remove the Injuries of the Neck, as ſoon as the Bones are replaced. If any kind of Luxation requires an accurate Retention by Bandage, it muſt certainly be this of the Clavicle; eſpecially when the Luxation has happened ſome time before its Reduction: For beſides that the Clavicles have ſcarce any Muſcles to ſupport them, their Ligaments are generally ſo much ſtretched and weakened in this Caſe, that they are in no wiſe ſufficient to ſuſtain the Weight of the Arms. It will therefore be proper to apply ſuch a Bandage to the Neck, as we ſhall deſcribe at large in the Doctrine of Bandages. How the Clavicles are to be replaced.

IX. Such Luxations of the Clavicles as happen near the *Proceſſus Acromion*, are generally much the more difficult to diſcover; ſo obſcure, that, as HIPPOCRATES (*Lib. de Articulis*, *n.* 62.) and PAREY witneſs, abundance of the beſt Phyſicians, and Surgeons not a few, have been deceived in the *Diagnoſis* hereof, taking it to be a Luxation of the *Humerus*, and ſo have miſerably tortured the Patient to no purpoſe. Whenever this Luxation happens, as PAREY obſerves, the ſuperior Part of the *Scapula* ſticks up; but in the Place where the Clavicles are ſeparated from the *Acromion* Proceſs, a Cavity may be obſerved; moſt acute Pains ariſe, and the Arm itſelf cannot be moved or lifted up: If therefore the luxated Clavicles are not timely reduced, it is no wonder that we meet with ſome People, who from neglecting the Caſe, entirely loſe the uſe of their Arms afterwards, ſo as that they cannot lift them up to their Head or Mouth. GALEN himſelf ſays, (*in Comment. in* HIPPOCRAT. *Lib.* I. *de Articulis*, *n.* 62.) "I myſelf had once, in ſtruggling, my Clavicle ſo vaſtly ſeparated from the *Acromion*, that there appeared a *Sinus* between the Bones, of near three Fingers breadth." In the mean time, a ſtrict Bandage continued about the Parts for forty Days, to make the diſunited Bones again coaleſce, will be found very ſerviceable. (2.) near the *Acromion*.

X. From what has been ſaid it naturally follows, that the proper and principal Signs of a luxated Clavicle are, (1.) a Cavity between that Bone and the *Proceſſus Acromion* of the *Scapula*, which not being found in ſound Limbs, muſt indicate a Diſſolution of the mutual Connection between theſe Bones: (2.) The Patient not being able to lift his Arm up to his Head or Mouth. For the Cure, the Surgeon will find the principal Buſineſs thereof to conſiſt in a proper Extenſion and Reduction of what has been diſplaced into their right Order, to be performed in the ſame Method which we propoſed and ought to be uſed in Fractures of the ſame Bones, *Book* II. *Chap.* V. §. 4. But in applying the Bandage to this Caſe, all poſſible Care muſt be taken to retain every thing in its natural Poſition, and to perform the Bandage with Accuracy, becauſe it is the chief Remedy: For ſuch as are negligent in this Point, ſeldom perform a Cure without leaving ſome Stiffneſs or Weakneſs afterwards. How to diſcover a Luxation of the Clavicle.

CHAP.

CHAP. VII.

Of a LUXATION *of the* Humerus.

How the *Humerus* may be diſlocated.

I. THE *Humerus*, from the Length and Laxity of its Ligaments, the Largeneſs of its Motion, and the Shallowneſs of the Cavity in the *Scapula*, into which it is articulated, is thereby rendered of all Bones the moſt ſubject and eaſy to be luxated. The Head of this Bone may often be diſlocated under the Arm-pit, ſometimes forwards, ſometimes backwards, and even below the *Scapula*, but ſeldom perpendicularly downwards, and never directly upwards, unleſs the *Acromion* and *Coracoide* Proceſſes of the *Scapula* ſhould chance to be fractured at the ſame time: Beſides, as long as the ſtrong *deltoide* and *bicipital* Muſcles of the *Humerus* remain entire, they greatly reſiſt and keep down the *Humerus* from being luxated upwards.

Signs of a luxated *Humerus*.

II. When the *Humerus is luxated downwards*, (1.) there ſuddenly appears a Cavity, and upon preſſing with the Fingers you will perceive a *Sinus*; but under the Arm, there muſt be a Tumor, becauſe the Head of the Bone is thruſt there: (2.) The *Proceſſus Acromion* will ſeem to ſtick out further than uſual, becauſe of the adjacent *Sinus:* (3.) The luxated Arm will be longer than the other, and it cannot be lifted up towards the Head without violent Pain, and ſometimes it cannot be lifted up at all, or even extended. But when the *Humerus is luxated forwards* as well as downwards, there will be obſerved the ſame *Sinus* under the *Proceſſus Acromion* as before, and a Tumor will appear from the Head of the *Humerus* projecting towards the Breaſt, under the *Axilla*; the Arm itſelf alſo cannot be moved without exciting the moſt acute Pain: Laſtly, when the *Humerus is luxated backwards*, the *Cubitus* is thrown forwards towards the *Præcordia*, and the Head of the Bone makes a Protuberance in the Shoulder; the Arm itſelf cannot be bent nor extended, nor even pulled outwards from the Breaſt, without occaſioning the moſt violent Pains: And no Luxation of this Limb is attended by ſuch dangerous Symptoms as when it is diſlocated forwards or inwards; becauſe the luxated Head of the *Humerus* cannot avoid injuring the large Arteries and Nerves of the Arm, in conſequence of which various Symptoms will ariſe.

Prognoſis.

III. If Aſſiſtance be had to theſe Luxations ſoon after they have been inflicted, before the bad Symptoms come on, the Reduction of them into their natural Places again, may be effected without much Difficulty; more eſpecially, if the Bone luxated be directly downward or backward, it may be very eaſily reduced; but very difficultly when luxated inward, under the pectoral Muſcle. So it may be eaſily replaced when the Arm retains its natural Length; but if it be ſhorter, and the Accident has been done ſome time, or accompanied with Tumor, Inflammation, or a Fracture of the *Proceſſus Acromion*, it is then a very difficult matter to reſtore the Limb to its former Strength and Motion. But when the Head of the *Humerus* grows faſt to ſome of the adjacent Parts under the Arm, it can often be reſtored by no means whatever. The Reduction is alſo more difficult in People that are ſtrong, or fat, than in ſuch as are lean, or weak.

IV. As

IV. As ſoon therefore as the Luxation is diſcovered in the *Humerus*, the ſafeſt Way will be to ſeat the Patient on the Floor, or on a low Stool as at *Tab.* X. *Fig.* 3. A. Two ſtrong Aſſiſtants are to be placed on each Side the Patient, one of which B, is to keep firm hold of his Body, that it may not give way to the Extenſion; while the other C, lays firm hold of the luxated Arm with both his Hands, a little above the *Cubitus*, gradually and ſtrongly extending it. But before that Extenſion be made, the Surgeon himſelf D, ſhould have a large Napkin, of a ſufficient Length, tied at the Ends, and hung about his Neck ſo that the Knot may be behind; but the other Part of the Napkin E, muſt hang over his Breaſt. Then the Patient's Arm muſt be put through the Napkin up to the Shoulder, and the Surgeon at the ſame Time lays hold of the Head of the *Humerus* with both his Hands. This done, he orders the Aſſiſtant to ſufficiently extend the Limb, and in the mean Time he elevates himſelf the Head of the Patient's *Humerus* by the Napkin about his Neck, directing it with his Hands till it ſlip into its former Cavity in the *Scapula*. But I would adviſe the Surgeon to move the Head of the *Humerus* one way and the other, according to the manner in which it is luxated; which muſt be left entirely to his Diſcretion: And by this means I have happily reduced a great many recent, though not inveterate Luxations of this Joint, particularly three in one Month, and that by no other Aſſiſtance or Machinery.

How a Luxation of the *Humerus* is to be reduced.

V. Though the Method now deſcribed for reducing this Luxation ſeems to be the moſt ſafe, ready, and commodious of any hitherto invented for that Purpoſe; yet it is found, that the Extenſion cannot by this means be made ſufficiently ſtrong, in ſome Caſes: And this particularly when the Patient is very robuſt, or when the Caſe has been delayed ſome Time, without any Aſſiſtance. Therefore when one or two Aſſiſtants are not able to retain the Patient, and ſufficiently extend his Arm, it is much the beſt way to uſe a long Napkin with more Hands; or to apply the Girt of HILDANUS (*Tab.* VIII. *Fig.* 17.) about the *Humerus* a little above the *Cubitus*, and to make the Extenſion by a Rope put through the two Hooks, and by another Rope faſtened to the middle of that, letting as many Aſſiſtants pull as may be ſufficient, according to the Circumſtances of the Caſe. But when the Extenſion is made with a great Force, it requires to be antagoniſed by a ſtill greater Force, to keep the Patient ſteady; therefore it is proper to retain the Patient by two Aſſiſtants, and if they are not ſufficient, to uſe a long Napkin or Piece of ſtrong Linen, ſlit and made in form of the Slings at *Tab.* X. *Fig.* 1, 2. that the luxated *Humerus* may be put through the Slit up to the *Scapula*: The one half of this linen Sling being to come over the Breaſt, the other half behind the Back, and both to meet afterwards together in a Knot; this is to be faſtened upon a Hook, or given into the Hands of ſeveral Aſſiſtants, or elſe it may be faſtened to a Beam or ſome other fixed Point, ſo as to keep the Patient from being moved out of his Place. While this is performing, the Surgeon's immediate Buſineſs is to accurately lift up, agitate, and reſtore the luxated Bone to its right Place, as we before directed: But when this method alſo alone is inſufficient to extend the *Humerus*, it will be proper to apply to it the Pulley, *Tab.* VIII. *Fig.* 15. and keeping the Patient firm, to make a prudent Extenſion of the *Humerus*, much as we propoſed before in a Fracture of the Thigh, *Book* II. *Chap.* VIII. §. 3.

The bare Hands are ſometimes inſufficient for the Extenſion.

The *Ambe* of HIPPOCRATES.

VI. In these kinds of Luxations, when the Hands were insufficient for Extension, the Ancients, and particularly HIPPOCRATES, made use of a Machine which they called (ἀμβὴν) *Ambe*, which may be seen delineated in *Tab.* X. *Fig.* 4, & 5. It consists of a Pillar or *Fulcrum* A A, and the moveable Lever B C, which is placed under and bound to the *Humerus* in the manner of *Fig.* 5. by the Ligatures E E E: When this is done, the End of the Lever B is carefully and gradually pressed downward, by which means the other End of the Lever C, is moved upward, and thus the luxated Arm is both extended, and its Head replaced at the same Time: This was frequently used with so much Success by them, that the Machine got a great Name, and is to this Day called the *Ambe* of HIPPOCRATES. Notwithstanding it was very successful, and may be still in such Cases where the Head of the *Humerus* was luxated directly downward; yet, when the Head of the *Humerus* is luxated on one side, or beneath the Neck of the *Scapula*, as generally happens, the Instrument elevating only directly upwards could not reduce the Luxation, but contused or lacerated the adjacent Parts, or else threw up and pressed against the Neck of the *Scapula*, often exciting violent Pains, in such manner that (to say nothing now of its other Defects) it has been generally neglected by most for this long while, and is now wholly rejected.

Of other Artifices for this Purpose.

VII. To proceed, we must not omit taking notice here, that there are several other Methods and Contrivances invented not only by the Ancients, but also many of the modern Physicians and Surgeons, for reducing a Luxation of the *Humerus*. Those of the Ancients are delineated by ORIBASIUS *(Lib. de Machinamentis,)* PAREY (in his *Surgery*, *Book* XV.) GERSDORFF, BRUNSVIG, SCULTETUS *(in their Chirurgical Writings)* and other eminent Surgeons. As for the modern Contrivances, two of their Machines are published in the *Acta Eruditor. Ann.* 1683. *pag.* 37, another in JUNCKENII *Chirurgica Germanica*, *pag.* 168, where he treats of Luxations; another in PURMANNI *Chirurg. Curios. Tab.* XIV. *pag.* 692; and still another in PETIT's *Treatise on Diseases of the Bones*. And though these latter seem to be each in great Esteem with their own Authors, every one thinking he had mended the Defects of his Predecessors; yet there are some of the *French* Surgeons who esteem and publickly declare them to be either unnecessary, or less suitable than the *Ambe* of HIPPOCRATES. There are even some who look upon all Machines as unnecessary in this Case, but the Hands, and Napkins or Slings; as GOUE, a *French* Man too, in his *Surgery*.

Of PETIT's Machine.

VIII. But because PETIT is an ingenious Surgeon, and well versed in his Profession, I thought it would be worth while to exhibit here the Machine which he so vastly commends, and to give a short Description thereof; but such as desire a more full Account, may consult the Author's Book of Instruments itself. PETIT made it his Business to contrive his Machine so as not only to make a sufficient Extension of the Limb, which others had invented Means to answer very well before, but also to make a counter Extension or Resistance at the same Time, to retain the Patient, and particularly his *Scapula*, sufficiently firm from giving way to the Extension of the Limb made by the Instrument; with this View he made a sort of Buttress or Supporter (*l' Arcboutant*) of Ticken, a Foot long, sufficient Strength, and lined with Leather as at *Tab.* X. *Fig.* 7. The Arm is to be first put through the Opening A, so as to make one End B come over the Breast, and the other End C to go cross the Back. Its two Holes, DD, let

in

in the two Horns or Legs of the Machine *Fig.* 6, *a a*, whoſe other End, B, is lodged upon the Ground. In this Machine there are ſeveral little Pulleys *cc*, *cc*, as in the *Polyſpaſton* of *Tab.* VIII. *Fig.* 16. round which paſſes the Rope *ddd*, there is alſo a moveable Handle E, by which the Rope is wound up through the Pulleys, and the luxated Arm by that means extended. But that the Arm may be the better extended, he uſes a peculiar Sling A A, *Fig.* 8. made of ſoft and double Leather, fourteen Inches long: This he faſtens ſtrongly round the lower Part of the *Os Humeri* a little above the Elbow; the Skin being firſt pulled upwards, it is to be kept firm upon the Limb by means of a ſilk Cord, three Quarters of an Ell long, ſewed in a particular manner to the Leather of the Sling, and to be faſtened by a Knot at the two Ends *b b*: To this ſilk Cord is faſtened another Sling *c d e*, by two moveable Loops *f f*, to which is to be annexed the Rope *ddd*, which paſſes round the Pulleys of the Machine. The Apparatus being all rightly fitted, he orders his Aſſiſtant to wind up the Rope by the Handle E, *Fig.* 6. The Rope becomes by that means ſtretched, and the Arm to which it is faſtened is gradually extended. In the mean Time the Surgeon directs the Head of the *Humerus* with his Hands, that it may again obtain its natural Place, which it very often does of its own accord, without the Direction of the Surgeon.

IX. But to give my Opinion impartially concerning the Uſe of Machines for reducing a Luxation of the *Humerus*, I muſt needs ſay that the Surgeon's Hands and a Napkin, with ſtrong and dexterous Aſſiſtants to make the Extenſion, and hold the Patient firm, will of themſelves be generally ſufficient for the Buſineſs: But if any one be willing to uſe other Methods, he may pitch upon thoſe as the beſt, which ſufficiently extend the Bones, and equally ſtretch the Muſcles every way alike. Upon this Principle we may readily judge whether the *Ambe* of HIPPOCRATES be ſufficiently proper or no to be applied in this Caſe; or the ſtill more uncertain method of pulling and extending the luxated Arm over a Gate, Ladder, or Beam, by a Couple of tall and ſtrong Aſſiſtants, in ſuch manner as to lift the Patient off his Legs; or when a luſty and ſtrong Aſſiſtant ſits down on the Floor, and preſently laying hold of the Patient's Arm, ſuddenly raiſes himſelf up thereby; or laſtly when the Patient is ſeated on the Ground, and placing the Hands under the Head of the *Humerus* it is violently pulled upward, or any other way extended; all which Methods are handled at large by PAREY, in his *Surgery*, *Book* XV. But here it muſt be cautiouſly obſerved over and over, that the Nerves, Veins, Arteries, Muſcles, and the Bones themſelves, be not contuſed or broke, by the too great Strength and Suddenneſs of the Extenſion. That ſuch Accidents as theſe may readily happen in a rough Extenſion of the luxated Arm over a Gate, *&c.* where the Patient is ſuſpended by it, we ſhall find no room to doubt, eſpecially if we conſider the Reaſons and Inſtances cited by PETIT (in his Chapter on a Luxation of the *Humerus*) and others. And ſince this is the Caſe, the Surgeon's principal Care and Buſineſs in the Extenſion will be, to let the Arm be ſtretched out with a Force ſtrong enough but equable, before he ſtrives to replace the luxated Head of the Bone, elſe he does nothing.

Of other Methods leſs in uſe.

X. There is ſtill another new and very conſiderable Machine with a Pulley, which I received not long ago from a very eminent Surgeon, deſigned for the Reduction of an obſtinate and inveterate Luxation of the *Humerus*; whoſe great

A new Machine.

Advantages he very much praiſed and recommended to me: But becauſe I have not yet had Opportunity to uſe it, and ſo could not experience its Effects, I muſt refer the Deſcription thereof to another Opportunity.

CHAP. VIII.

Of a LUXATION *of the* Cubitus.

In what manner the *Cubitus* may be luxated.

I. THE *Cubitus* conſiſting of two Bones, the *Ulna* and the *Radius*, is articulated by *ginglymus*, which the *French* call *Charniere*, as is evident from what is ſaid of theſe Bones in the Writings of Anatomiſts. The Connection of theſe Bones is ſuch, that the *Ulna* or *Cubitus*, as being the largeſt Bone and ſeated in the inferior Part of the Arm, does of itſelf perform the whole Flexion and Extenſion of the Arm, yet it cannot perform that Motion without carrying the *Radius* along with it; ſo that the *Radius* always follows the *Ulna* in Flexion and Extenſion. But on the other hand, the *Radius* may be turned along with the Hand both inward and outward, without at all moving or bending the *Ulna*; as when the Pronation and Supination of the Hand is made thereby. Both theſe Bones of the *Cubitus* are ſo articulated with the lower Head of the *Os Humeri*, that large Protuberances are received into deep Cavities or Grooves, and the whole inveſted and faſtened with exceeding ſtrong Ligaments. So that notwithſtanding the *Cubitus* may be luxated in all four Directions, outward, inward, forward, and backward, yet it is but ſeldom that it ſuffers a perfect or entire Diſlocation: Unleſs the upper Part of the *Ulna* called *Olecranon* be broken, or the Ligaments of the *Cubitus* much weakened, by ſome very great external Violence.

How to diſcover a Luxation of the *Cubitus*.

II. If the *Cubitus be luxated backward*, which is the moſt frequent of all others, then the Arm becomes crooked and ſhorter, and it cannot be extended. In the inward Part of the Bend of the Arm, the Head of the *Humerus* may be obſerved to ſtick out; in the back Part of the ſame, the Head of the *Ulna* or *Olecranon* will be protuberant, and between both Bones will appear a *Sinus* or Cavity. But it very ſeldom happens that the *Cubitus is luxated forward*, from the Largeneſs of the *Olecranon*; unleſs that be fractured at the ſame Time: But if this ſhould happen, the Head of the *Humerus* will ſtick out behind, and that of the *Cubitus* before; and there will be a Cavity more or leſs in proportion to the Degree of the Luxation. When the *Cubitus is luxated externally*, the Protuberance appears on the outſide of the *Cubitus*; and the contrary when luxated inwards. To conclude, unleſs the Ligaments and Muſcles of the *Cubitus* are quite broke in two, it is ſo far from being capable of ſuffering perfect Diſlocation, that no more can happen to it than a Subluxation, *i. e.* it can recede but a very little way out of its right Place. But whatever of this kind happens, the Caſe may be very eaſily underſtood, by feeling and inſpecting the Part.

Prognoſis.

III. Since in the more violent kind of theſe Luxations of the *Cubitus*, the Tendons and Ligaments muſt be very much ſtrained; it is no wonder (if theſe be not ſpeedily helped) that there ſhould follow grievous Pains, Tumors, Inflammations, Convulſions, Vomiting, Fever, and at length Gangrene and Death: An ample Witneſs whereof is PAREY in *Book* XIV. *Chap.* 18. and

Book

Book XVIII. *Chap.* 33. And to make no Diſſimulation in the Caſe, when the *Cubitus* is diſlocated it is a very difficult Matter to replace it again, by reaſon of its Inequalities and ſtrong Ligaments: And this more eſpecially when the Luxation is very violent inveterate; for the ſlighter and more recent the Luxation, the more eaſy will be the Reduction.

How a Luxation of the *Cubitus* is to be replaced.

IV. Be the Luxation however more or leſs, the Patient muſt be ſpeedily placed in a Chair, and both parts of the Limb, the *Humerus* and the *Cubitus*, muſt be extended in oppoſite Directions, by two ſtout Aſſiſtants, till the Muſcles are found pretty tight, with a free Space between the Bones. Then the luxated Bone muſt be replaced, with the Surgeon's bare Hands, or together with Bandages; and that the Proceſſes may fall into their *Sinuſes*, the *Cubitus* muſt be afterwards ſuddenly bent. But if the Tendons and Ligaments are ſo violently ſtrained, that they can ſcarce perform their Office; it will not be improper to anoint them well with emollient Oils, Ointments, or the Fat of Animals, or to apply emollient Fomentations and Cataplaſms. Where he bare Hands are not ſufficient to make a proper Extenſion upon the Limb, in this Caſe it will be very proper to uſe the Means and Inſtruments which we before propoſed in *Book* II. *Chap.* VIII. §. 3, and 4.

How the *Cubitus* is to be treated after Reduction.

V. As ſoon as the Reduction has been by theſe means effected, the Articulation muſt be bound up with a proper Bandage, and the Arm is to be afterwards ſuſpended in a Napkin or Sling about the Neck. But Care muſt be taken, as HIPPOCRATES himſelf adviſes, that the Bandage be not ſuffered to be on too long, nor the Arm to be kept all the Time ſtill, without ſome gentle Motion: For thus there would be danger of the Mucilage of the Joint becoming inſpiſſated, whereby the Articulation might become ſtiff, and quite loſe its Motion. But happily to prevent this, it is very neceſſary to undo the Bandage every, or every other Day, and to gently bend and extend the Limb: Afterwards, Compreſſes dipped in burnt Wine, may be applied hot, and held on firm with Bandage, till the Ligaments and Articulation regain their former Strength.

CHAP. IX.

On LUXATIONS *of the Hand*, Carpus, Metacarpus, *and Fingers.*

Luxation of the Hand.

I. NOtwithſtanding the Hand is very accurately connected to the two preceding Bones, and particularly to the *Radius*, by means of the *Carpus* and ſtrong Ligaments, yet it ſometimes ſuffers Luxation in all four Directions: But it is generally not ſo eaſy to be luxated on either Side, as forward or backward, becauſe of the two Proceſſes of the *Radius* and *Ulna*, which guard it on each Side. The Hand is ſaid to be *luxated forwards* or *inwards*, when it recedes from the Muſcles which bend the Fingers; to be *luxated backward*, when it departs from the Muſcles which extend the Fingers. Much alſo in the ſame manner, the Hand is judged to be *luxated outwards*, when the *Carpus* makes a Tumor near the Thumb and a Cavity near the little Finger; to be *luxated inward*, when the contrary happens. This being rightly conſidered, it will not appear difficult to diſtinguiſh the Signs by which we are to diſcover a Luxation of the Hand.

II. For

Symptoms and Prognoſis.

II. For if a Luxation of this kind ſhould happen, it can hardly avoid being accompanied with violent Pains, on account of the Ligaments (though ſtrong) being too vehemently ſtrained; the Fingers alſo cannot be bent nor extended, from the violent Compreſſion of their Tendons; upon which account, it is no wonder if there follows grievous Inflammation, Tumor, Abſceſs, Stiffneſs of the Joint, and *Caries* of the ſpongy Bones in the *Carpus*; which evils are ſeldom remedied but by amputating the Limb. But when the Luxation is but ſlight and recent, the Cure may be effected with much more eaſe, and the Diſlocation will not be attended with ſuch grievous Symptoms.

How a Luxation of the Hand is to be reduced.

III. It therefore ſeems to be the ſafeſt way immediately to reduce what is diſplaced: And that this may ſucceed the better, two things are to be chiefly regarded; (1.) That the luxated Hand be ſufficiently extended by two Aſſiſtants, one of which is to lay hold of the Hand, and the other of the *Humerus*, pulling in oppoſite directions: (2.) That the Part of the extended Hand where the *Sinus* is, be placed on a Table or ſome other flat Body, that whatever ſticks up may be depreſſed. By which method the Hand, in whatever Part luxated, may be very readily reduced into its natural Seat.

Luxation of the Carpal Bones.

IV. It alſo ſometimes happens that one or two of the eight little Bones of the *Carpus* are luxated and diſtorted from their natural Seat by ſome external Violence. When this happens, there will be perceived a Tumor in one Part, and a Cavity in another, which may be alſo felt by the Fingers; beſides, violent Pains will be felt by the Patient. For the reſt, as this kind of Luxation is very eaſily diſcovered, partly by the Sight, and partly alſo by Feeling; ſo, when it is recent it is almoſt as readily cured, letting the Hand be extended in the manner we before propoſed (at §. 3.) and the diſlocated Bone be afterwards forced into its place.

Luxation of the *Metacarpus*.

V. The four ſmall Bones which are found in the *Metacarpus* or Palm of the Hand, may be ſometimes luxated from the *Carpus* itſelf, to which their upper Parts are connected; which uſually happens from ſome external Violence; notwithſtanding they have a natural Inclination to reſiſt ſuch Luxation: For the two carpal Bones which are ſeated in the middle between two other external ones, cannot be diſlocated to either Side; as the two external ones which ſuſtain the firſt and little Fingers cannot be luxated inwardly, but are more eaſily drove outward; though each of them may be luxated on the fore or back Part of the Hand. But whichever of theſe happens the particular Diſorder may be diſcovered and examined by feeling and inſpecting, and the Cure may be carried on in altogether the ſame method which we directed before at §. 4.

Luxation of the Fingers.

VI. Laſtly, the Bones of the Fingers, to which we join thoſe of the Thumbs, are liable to Luxation at each of their Articulations, and that in ſeveral Directions. But theſe Accidents are both very eaſy to diſcover and cure. For the Ligaments being not very robuſt, the Fat and Muſcles thin, and the *Sinuſes* of the Articulations ſhallow, renders the Extenſion very eaſy, and the Reduction of them into their former Places may be done very readily: While one Hand of the Surgeon extends the Finger, he ſtrives with his other to replace the Bones in their natural Seat. The Bandage proper to dreſs the Finger after Reduction will be explained more at large in the Third Part of this Book, where we treat profeſſedly on Bandages.

CHAP.

CHAP. X.

Of a LUXATION *of the Thigh.*

I. VERY rare is it that the Head of the Thigh Bone is diſplaced out of its *Acetabulum*; though formerly it was ſuppoſed to be pretty frequent, the Phyſicians taking a Fracture thereof for a Luxation, as we have obſerved in treating of Fractures. *See Book* II. *Chap.* VIII. §. 6. and *Book* III. *Chap.* I. §. 9. the Reaſon whereof may be taken from the Articulation itſelf: (1.) How very deep is the *Sinus*, call'd by the Ancients *Sinus Coxæ*, and by the Moderns *Acetabulum*, into which the Head of the Thigh Bone is received; (2.) with what a broad concave Cartilage is almoſt the whole Head of that Bone covered; (3.) how ſtrong are the Ligaments with which it is faſtened; (4.) how greatly is it defended with exceeding ſtout and thick Muſcles; (5.) but how very brittle is the Neck of this Bone beyond any other Part thereof: So vaſtly do all theſe obtain, that the Neck muſt be vaſtly more frequently and eaſily broke than its Head diſlocated[a]. And though ſomething of this kind may ſometimes happen, ſo as to make the Head of the Thigh Bone ſlip out of its *Acetabulum*; yet that generally proceeds more from internal than external Cauſes. For we find it has been obſerved by very ſkilful Phyſicians, that the Ligaments of the Thigh Bone, though very ſtrong, may be by various Cauſes, and particularly by a Flux of Humours, ſo relaxed and weakened, as to let the Head of that Bone ſlip ſpontaneouſly out of its *Acetabulum*: So that it ſhould ſeem no great wonder if the Thigh ſhould be ſometimes luxated even while the Patient lies in Bed, without any external Violence, as I have ſometimes ſeen [illegible] they riſe, one Leg appears longer or ſhorter than the other, and ſeems as if it were unhinged. *Vid.* HIPPOC. *Aph.* 59, 60. §. 6. ZWINGER *Theat. Pr[illegible] Part.* II. *pag.* 110. *ſub tit. Luxatio.*

The Thigh ſeldom luxated.

II. But this Caſe does not happen ſo eaſy in robuſt Adults as in ſuch as are more young and tender, as we before obſerved. For I remember to have ſeveral times obſerved this Caſe of a ſpontaneous Luxation, though other Phyſicians and Surgeons were of a contrary Opinion, becauſe they could not find that any external Violence had gone before: But though it was preceded by no external Violence, Experience has taught me, that the Head of the Thigh Bone may thus ſlip out of its *Acetabulum*; being the Conſequence of preternatural Humours or ſome other Diſeaſe, whereby the Ligaments and Articulation are render'd infirm.

Happens oftener in Infants than Adults.

III. Whenever the ſaid Head of the Thigh Bone is thruſt out, it is almoſt always wholly diſplaced, ſo as to make a perfect Luxation. The exact Roundneſs of this Head, with the great Force of the circumjacent Muſcles, and the Narrowneſs of the Sides of the *Acetabulum*, will not admit the Bone to be diſlocated a little way only: For as ſoon as the Head of this Bone is thruſt up to the Edge of the *Acetabulum*, it muſt unavoidably either [illegible] quite out, or

When the Thigh is luxated, it is generally perfectly ſo.

[a] To theſe we may add, that the celebrated CHESELDEN in his Anatomy [illegible] that upon opening two Subjects, whoſe Caſe every body thought to be a Luxation, the Neck of the [illegible] was found fractured. And WISEMAN, with other eminent Surgeons, wholly deny any Luxat[illegible]

elſe fall back again into its right Place. Yet there are ſome who hold that the Thigh may ſuffer an imperfect Luxation.

The Thigh may be luxated in ſeveral Directions.

IV. The Thigh is uſually luxated four ways; *upward*, *downward*, *backward*, and *forward*; but it is moſt frequently diſlocated downwards and inwards, towards the large *Foramen* in the *Os Pubis*. For beſides that the cartilaginous Defence on the lower Part of the *Acetabulum* is not ſo high as the reſt, the *Ligamentum rotundum* is found to give way more eaſily in that Part than any other; and laſtly, the adjacent Muſcles are found to be weakeſt in their Reſiſtance on this Part, being inſufficient to keep the Head of this Bone from ſlipping out: And then there is a certain Eminence in this Edge of the *Acetabulum*, which keeps the Head of the *Os Femoris* from falling back again into its right Place. But if the Head of this Bone be diſplaced outwards, it generally ſlips upwards at the ſame time; it being ſcarce poſſible but the very ſtrong Muſcles of the Thigh muſt then draw the Bone upwards, and then there is no Eminence there, in the Edge of the *Acetabulum*, to reſiſt the Head of the Bone in that Paſſage.

Signs of the Thigh luxated, (1.) downward and forward.

V. When the Thigh is diſlocated forwards and downwards, which is what uſually happens, the Leg hangs ſtraddling outward, and is longer than the other; alſo the Knee and Foot turn outwards; the Head of the Bone itſelf will be felt near the lower Part of the *Inguen* and *Os Pubis*. Sometimes there is a Suppreſſion of Urine in this Caſe, when ſome Nerve which communicates with the Bladder is violently compreſſed. In the Buttock may be perceived a Cavity, from the *Trochanter Major* and the reſt of the Bone being diſplaced; and if the Thigh Bone be not timely replaced into its *Acetabulum*, the whole Limb withers ſhortly afterwards. And this is the Reaſon why the Patient can bear little or no Streſs upon that Limb, but muſt always incline, and throw the Weight of his Body, upon the other, leſt he would fall down. In like manner, when they walk or go forward, the Perſon muſt move that Limb in the Form of a Semicircle; but as for the Body itſelf, it is obliged to be ſupported under the Arms by Aſſiſtants, or elſe by Crutches and Sticks. Though there are not wanting particular Caſes, ſome of which I have been witneſs to, where the Head of the luxated Thigh Bone has grown ſo firmly to the adjacent Parts without the *Acetabulum*, as to become, in proceſs of time, ſo ſtrong as to ſupport the Body without Crutches or Sticks, though they always halted in walking.

(2.) upward and outward.

VI. But if the Thigh Bone be diſplaced backward, it is uſually drawn upward alſo at the ſame time, as we before obſerved. Hence there will be perceived a Cavity behind the *Inguen*; but upon the Haunch or Buttock, a Tumor; becauſe the Head and *Trochanter* of this Bone will be thruſt there. The Tumor in the Haunch being thruſt upwards, the reſt of the Limb will become ſhorter than the other, and the Foot will ſeem to turn inwards; the Heel will not touch the Ground, and ſo the Perſon will ſeem to ſtand upon his Toes: And laſtly, the luxated Limb may be bent with more eaſe than extended; alſo the Body is uſually ſuſtained more firmly by this Limb when luxated backward than forward; becauſe, in the firſt Caſe, the Feet are removed farther from each other: And this is the Reaſon why a great many in Caſes of this kind which have been cured by Surgeons without reducing the Bone, are able to ſtand firmly and walk, eſpecially if they have a Shoe with a very high Heel to it. But there generally follows ſomething of a ſlight withering or decay in the Limb afterwards, from the Nerves being in ſome meaſure compreſſed; though this Accident

dent is much ſlighter here than at §. 5. Laſtly, it is extremely rare that the Thigh is luxated forward or backward without being alſo drawn upward or downward, as we before obſerved; but if it ſhould ſo happen, it may be evidently diſcovered by what we have been juſt now ſaying, and from conſidering the Structure of the Articulation.

How to diſtinguiſh between a Fracture and a Luxation of the Thigh.

VII. As it is very difficult to diſcover whether the Thigh Bone be diſlocated or fractured, both by feeling and inſpecting, becauſe of the great Thickneſs of the Muſcles and Integuments; it is therefore, in my Opinion, a matter of ſome Conſequence to propoſe the following Signs, which we recommend for diſcerning one from the other. We do not without Reaſon judge the Thigh to be luxated (1.) when we find the Ligaments of the Bone have been relaxed by ſome preceding Congeſtion of Humours, and when no external Violence has been exerted upon it; (2.) when neither the Smyptoms, Pain, Tumor, nor Inflammation follow; and laſtly, (3.) when the whole Limb may be bent, and turned about at the *Acetabulum* without any cruſhing of the Bones, which is otherwiſe common in Fractures. The contrary of theſe Signs are ſtrong Indications that a Fracture is preſent.

Prognoſis.

VIII. If it be difficult to diſcover whether the Thigh be fractured or luxated, as we have before made evident; its proper Treatment and Cure will be found much more ſo. *See Book* III. *Chap.* I. §. 9. For this Difficulty there are many Reaſons: For (1.) the Force and Thickneſs of the adjacent Muſcles themſelves, hinder the Thigh from having a ſufficient Extenſion; eſpecially if it be in the ſtrongeſt ſort of Men; hence, (2.) for the ſame Reaſon the Reduction of the Bone will be very difficult to effect, and when it is effected, it will be a hard matter to diſcover: And (3.) if the Thigh ſhould happen to be replaced quite home as it ſhould be, yet there is great Danger of its ſlipping out again, from the Laxity of the Ligaments and Slipperineſs of the Parts. To which we may add (4.) that the Ligaments happen to be ſometimes quite broke or lacerated from the greatneſs of the external Violence: And laſtly, we muſt not forget that (5.) the Mucilage of the Joint becomes often ſo inſpiſſated in the *Acetabulum*, as not only to prevent its Reduction, but often alſo, to thruſt it out again when once replaced: So that it is no wonder if ſuch become halt or lame, as have their Thigh Bone luxated, and reduced not at all, or elſe when it is too late.

Cure of the Thigh luxated forward and downward.

IX. The luxated Bone is always to be replaced in a method agreeable to the Nature and Direction of the Diſlocation. When it is diſplaced forwards and downwards, the Patient is to be laid flat upon his Back on a Table; then a Linnen Napkin or ſtrong Sling is to be made faſt over the Groin about the Part affected, ſo that one End of the Sling may come over the Belly, and the other over the *Nates* and Back, to be both tied together in a Knot upon the Spine of the *Os Ileum*, and afterwards faſtened to a Hook fixed in ſome Poſt or held firm by ſome Aſſiſtants; rather the firſt if we uſe the *Polyſpaſton* or Pulley, to retain the Patient's Body firm from giving way in the Extenſion. In like manner, at the Bottom of the Thigh, a little above the Knee, there muſt be alſo faſtened another Napkin, Sling, or the Girt of HILDANUS at *Tab.* VIII. *Fig.* 17. with a Compreſs between it and the Thigh; both the Slings being drawn tight, the Thigh is to be extended, not vehemently, but only ſo much as is ſufficient to draw the Bone out of its *Sinus*, that it may be replaced into its *Acetabulum* by the Surgeon's Hands; one Hand is to preſs the Head of the Thigh Bone

outward, while the other conducts the Knee inwards; or the Reduction may be made by Napkins, fastened round the Extremities of the Thigh like Slings, much as in a Luxation of the *Humerus*; which will be more likely to succeed, if the Knee be at the same time pressed inwards by the Hands. When the fore-recited means are not sufficient to make the Extension, it will be necessary to make use of the *Polyspaston* or Pulley which we proposed before in *Book* II. *Chap.* VIII. §. 4. As soon as the Thigh is found to be sufficiently extended, the Surgeon must take particular Care to restore the luxated Head of the Thigh Bone with his Hands from the *Os Pubis* into its former Seat.

X. Whenever the Thigh is luxated backward, the Patient is to be placed flat on a Table with his Face downward, and the Thigh is to be extended in directly the same manner but a little more strongly than we just now proposed, and the Reduction is to be effected afterwards by the Surgeon's Hands, an Assistant in the mean time extending the Limb and turning it inwards. By this Method the Head of the Thigh Bone generally slips very readily again into its *Acetabulum*. This being all rightly effected, the next business is to let the disordered Limb be well bound up, as we shall teach in the Doctrine of Bandages, and the Patient is to be closely reconciled to Rest in his Bed for three or four Weeks.

The use of PETIT's Machine.

XI. But in either Case, whether the Thigh be luxated forward and downward or backward and upward, PETIT greatly recommends his Machine before described in the Chapter on a Luxation of the *Humerus*; because the Hand and other Instruments are here very often insufficient, because of the many strong Muscles in this Part. But to make use thereof, the *Retinaculum* or Stay delineated at *Tab.* X. *Fig.* 7. is required to be not so broad, and it may be without the opening A, as the Thigh is not to be transmitted through it; but the middle thereof is to be applied to the Tubercle of the *Ischium*, one end being folded behind and the other before. The Patient is to be placed on his sound Side, that the luxated Thigh may lie upwards; but the Machine itself is to be placed between the Thighs, the Knee of the distorted Side being a little bent. The Sling *Fig.* 8. *Tab.* X. is to be fastened firmly round the lower Head of the Thigh, above the Knee, the Skin being first drawn tight upwards, as we advised before in a Luxation of the *Humerus*; it is then to be firmly fastened to the Rope passing round the Pulleys of the Machine *Fig.* 6. *d d.* And lastly, the Legs or Horns of the Machine *a a*, are to be put through the Apertures in the *Retinaculum* D D, *Fig.* 7. and by winding up the Rope by the Hand E, *Fig.* 6. it is to be gradually and carefully extended till the Surgeon perceives by the Limb that it is sufficient. This done, the Surgeon strives to reduce the Head of the Thigh Bone into its *Acetabulum*, from the *Sinus* where it was lodged, as we have before directed at §. 9.

More particularly in a Luxation forward and downward.

XII. But more particularly if the Thigh be luxated forward and downward, and sticks near the large *Foramen* in the *Os Pubis*, the Reduction in this Case is often very difficult. PETIT has in this Case substituted for the Legs or Horns of the Machine *a a Fig.* 6. others, which are expressed at *Fig.* 9. which has its ends transverse or lunar Processes: One of these A, he applies to the *Os Ileum*, and the other B, to the middle of the Thigh; he afterwards ties a Napkin about the Thigh, near the *Inguen*, which he makes fast to the Rope about the Pulleys of the Machine. He then makes the Extension by turning the Handle

of

of the Machine, by which means the Inſtrument exerts its Force in three different Places: The Part A retains the Patient firm, and reſiſts the *Os Ileum* as an immoveable *Fulcrum*; the Part B, when the Rope is drawn tight, turns the lower Part of the Thigh inwards; but the Napkin, which is faſtened about the upper Part of the Thigh, does by means of the Rope draw it outward: All which Motions are neceſſary to be performed, in order to reduce this Luxation. But be cautious againſt too ſtrong an Extenſion, becauſe the Limb is already too long of itſelf; yet the Extenſion ought to be continued till the Surgeon can replace the Bone from the *Sinus* where it was lodged into its *Acetabulum*; for if it be let looſe before this is effected, the Extenſion will be found to have been altogether uſeleſs, and muſt be repeated again.

XIII. If it ſhould ſuffer an imperfect Luxation (which yet very ſeldom, if ever happens, as we obſerved at §. 3.) and if the Head of the Bone ſhould ſtop upon the lower Part of the *Acetabulum*, the upper Part of the Thigh is then to be thruſt outwards with one Hand, while the lower Part is puſhed inwards by the other, and ſo the Bone may be properly reduced. But if the Head of the Thigh Bone ſhould ſtick upon the Edge of the *Acetabulum* backward, a Method contrary to the former muſt be made uſe of; *viz.* the upper Part of the Thigh muſt be thruſt inwards by one Hand, while the other Hand conducts the lower Part of the Thigh outwards. If luxated imperfectly.

CHAP. XI.

Of a LUXATION *of the* Patella *and Knee, or* Tibia *and* Fibula.

I. THE *Patella* is uſually luxated moſtly on the internal or external Side of the Joint; but if we may credit ſome Phyſicians, it is alſo ſometimes diſplaced both above and below the ſame. But whenever the Knee is perfectly luxated, the *Patella* can ſcarce avoid being diſplaced at the ſame time, becauſe of its ſtrong Connection to the Thigh and *Tibia*. I muſt confeſs there are more than a few among the common Surgeons, who, from their Unſkilfullneſs in Anatomy, and particularly Oſteology, are quite doubtful and at a loſs what to think about this Caſe, nor can they tell what is diſlocated when it happens. Hence it is no wonder if they treat this unknown Hurt of the Joint, as a Luxation made in the Knee itſelf, putting the Patient into various and painful Poſtures, and torturing him by extending and preſſing the Limb to no Purpoſe. But if one well verſed in Anatomy and the Structure of the Articulation ſhould examine the Caſe with a little more Exactneſs, there is no room to doubt but from comparing the diſordered and ſound Limb, he will be able to judge readily whether or no, or in what Part the *Patella* is luxated, and what method will be proper to be taken for its Cure. Luxation of the *Patella*.

II. The Reduction of a luxated *Patella* is uſually no very great Difficulty, if the Patient be laid flat on his Back upon a Table or Bed, or if he be laid in that Poſture upon an even Floor, ſo as that the Leg may be pulled out ſtrait by an Aſſiſtant. For then the Surgeon may firmly graſp the *Patella* with his Fingers, and afterwards preſs it ſtrongly into its right Place; which may be alſo effected if the Patient ſtands upright. When this is done, there remains no- How it is to be replaced.

thing but to carefully bind up the disordered Part, and to let the Patient rest gently for some Days, sometimes gently bending and extending his Leg to prevent it from growing stiff; till the Pains are gone off and the Limb has recovered its former Strength.

Luxation of the Knee.

III. A Luxation of the Knee is properly so when the *Tibia* recedes from under the *Femur*. The Leg is sometimes luxated from the Basis of the Thigh Bone, either on the out or inside, or backwards; seldom or never forwards, unless it be forced and drove very violently that way; because forwards, the *Patella* is bound against the Articulation, by the very strong Tendons of the Muscles which extend the Leg. Nor is it easy for the Bones of the Leg to be wholly displaced from that of the Thigh, so as to make a perfect Luxation; by reason of the great Strength of the Ligaments, and the two deep *Sinuses*, which receive the Head of the Thigh Bone; unless those very strong Ligaments should happen to be broke insunder at the same time. And this seems to me to be the Reason why People who suffer a perfect Luxation of the Knee are generally tortured with such violent Pains and Convulsions, that they are wholly spent or wasted thereby; or if they should escape that, they are generally troubled with Lameness and Stiffness in the Joint: But on the contrary, the slighter the Luxation, or the nearer it approaches to an Imperfect or Subluxation, the more easy it is generally to effect the Reduction and Cure. For the rest, as this kind of Luxation is very easy to discover from the thin covering of the Joint, with the Tumors and Cavities which follow; so when it is discovered, it is as difficult to make a perfect Cure thereof without letting the Bones join together; or leaving some Stiffness in the Knee; which first Accident is usually called an *Anchylosis*. For it is scarce possible that this Case should happen without greatly lacerating or confusing the Ligaments and Glandules which belong to this Articulation, so that their nutritious and mucilaginous Juice being inspissated in the Articulation, prevents the natural Motion of the Joint.

How it is to be replaced.

IV. When the Knee is but slightly luxated, the Patient is to be seated on a Bed, Bench or Table, and one Assistant holds the Thigh firm above the Knee, and the other extends the Leg; but the Surgeon in the mean time replaces the Bones by his Hands and Knee in its natural Place. If the Hands and Slings be not sufficient for this Purpose, it will be necessary to make use of the Instruments before described in *Book* II. *Chap.* I. §. 21. as the Girt of HILDANUS, and the *Polyspaston* or Pulley, *Tab.* VIII. *Fig.* 15, *and* 17. But we must be very careful here not to make the Extension so violent in Children and young People as to separate the *Epiphyses* from the Bones to which they are not yet firmly united; for by that means a worse Disorder and Lameness will be brought on. After the Luxation of the Knee is rightly reduced, it is to be properly bound up, and placed in a Straw Case; and the rest must be managed as we have before directed concerning the *Patella*, §. 2.

Luxation of the *Fibula*.

V. Sometimes the *Fibula* is separated by some external Violence from the Thigh Bone, and is then distorted either upward or downward; and this generally happens when the Foot has been luxated outward. Therefore whenever this happens, the Bone is to be first restored to its natural Place, and then properly bound up, the rest of the Cure being to be carried on as we directed at §. 4, *and* 2. till it be grown firm again to the *Tibia* and Leg. Lastly, Patients

tients ſhould be frequently cautioned not to uſe or bear any Streſs upon the diſordered Leg too ſoon; unleſs they would throw themſelves into a worſe Diſorder, an incurable Lameneſs.

CHAP. XII.

Of a LUXATION *of the Foot and Ancle.*

I. THE Ancle may be ſometimes luxated either in jumping, running, or walking, and then in all four directions, inward, outward, backward, and forward: Which of theſe ways it happens to be luxated may be diſcovered by the particular Poſture of the Joint; for when it is luxated internally, the Bottom of the Foot is turned outward; and on the contrary, when it is luxated outward, the Bottom of the Foot is turned inward; which latter Caſe is uſed to be much more frequent than the other. If it ſhould be diſlocated forward, the Heel becomes ſhorter and the Foot longer than it ſhould be; if backward, the contrary Signs will appear. Laſtly, the Ancle can ſcarce poſſibly be luxated outward unleſs the *Fibula* be ſeparated from the *Tibia*, or elſe quite broke, which may happen on the external Ancle. An Example whereof may be ſeen in LE DRAN *Obſ.* 109. Luxation of the Ancle.

II. Nor is it uncommon for a Luxation of the Ancle to be attended by the moſt grievous Symptoms, eſpecially when occaſioned by ſome very great external Violence. For it is ſcarce poſſible for it to happen otherwiſe in this Caſe, ſince the Diſtorſion of the Foot muſt overſtrain the adjacent Ligaments, Tendons, and Nerves, and thence excite moſt violent Pains: Or the Veins and Arteries may be alſo lacerated; by which means there will be a large Extravaſation of Blood about the whole Foot, which often gives riſe to a Gangrene. Of this Accident DIONIS gives an Example in his Book of Surgery. Luxation of the Ancle dangerous.

III. But it ſeems to be here worth notice, that the Ancle is not always luxated after it has been violently ſtrained by leaping, or turning the Foot on one Side. For it ſometimes happens in thoſe Caſes, that the Ancle is not diſlocated, but retains its proper Place, only the Parts are violently contuſed and ſtrained: In which Caſe the Patient may happen to be afflicted with the moſt ſharp Pains, great livid Tumor and Stiffneſs, ſo that he can neither ſtand nor walk, but is obliged to keep his Bed for a long time. Hence to attempt an Extenſion and Reduction in this Caſe would be altogether uſeleſs and improper. The Ancle is ſometimes only contuſed.

IV. The Ancle is more or leſs difficult to reduce in Proportion to the Violence of the Cauſe by which it is luxated. It is a general Obſervation that Oppoſites are uſually the Conſequences of Oppoſites. But the moſt ready way of reducing a Luxation of the Ancle is to place the Patient upon a Bed, Seat, or Table, letting the Leg and Foot be extended in oppoſite Directions by two Aſſiſtants, while the Surgeon ſtrives to reduce the Ancle with his Hands and Fingers. When the Foot is by this means once replaced, it is proper to bind up the Foot careſully, after it has been well bathed with *Oxycrate* and Salt, adviſing the Patient to keep his Bed a good while, till the Diſorder and its Symptoms quite leave him, and he finds his Ancle to have recovered its Strength ſo far as to ſuſtain the Weight of his Body without any Uneaſineſs or Danger. How the Ancle is to be reduced.

V. But

How a Contuſion of the Ancle is to be treated.

V. But in a Contuſion or great Strain of the Ancle, it will be not improper to plunge it ſuddenly into cold Water, and to repeat it for ſeveral Days. If any ſhould not care to undergo the Action of the cold Water, I would perſuade him to apply Compreſſes dipped in *Oxycrate* which has had Salt diſſolved in it, binding them on and renewing them often upon the diſordered Part. DIONIS runs directly into this method of Cure; he applies what the Surgeons call a Defenſative, made of the White of an Egg and Oil of Roſes beat up together, which being ſpread on Linen, he binds firmly upon the Ancles: In about three Days after, he makes a Decoction of aromatic and aſtringent Medicines, as Roſes, Wormwood, Roſemary, Granate Peels, and Allom, in Wine; and with this foments the Ancle well, and applies Compreſſes dipped therein, binding them on tighter than before: This continued about a Fortnight, he then applies ſome ſtrengthening Emplaſter, till the Pain and Weakneſs vaniſh.

A Contuſion of the Ancle ſometimes difficult to cure.

VI. So ſtubborn and unmoveable are violent Strains of the Ancles in ſome People, that they will give way neither to the Skill of the Phyſician, nor Virtue of Medicines, but are only to be removed by length of time. Inſtances are not wanting, where the Foot has been ſo greatly diſordered, for a Year's time after the Luxation, that the Patient could not walk in a way the leaſt uneven, nor go up and down a Pair of Strairs without great trouble. To remedy this Diſorder, the ſame is to be carefully obſerved here, which we obſerved before at §. 4. The Bandages which are proper here, we ſhall deſcribe hereafter.

Luxation of the *Calcaneum.*

VII. Sometimes it happens that only the *Os Calcis* or *Calcaneum* is luxated by ſome external Force, and that either towards the internal or external ſide of the Foot. Whichever way it happens, when there is Pain and Inequality of the Member, that is, when it has a Cavity in one Part and a Tumor in another, there is ſtrong reaſon to ſuppoſe a Luxation: And as ſoon as it is diſcovered, the ſame method of Cure is required with that we before recited, keeping the Limb quiet for ſome time afterwards.

Luxations of the other Bones of the Foot.

VIII. Laſtly, If any other Bone in the Foot, the *Tarſus* or *Metatarſus* ſhould happen to be luxated by ſome conſiderable external Violence, the Ligaments with the adjacent Nerves and Tendons are generally ſo affected as to excite not only moſt acute Pains, but violent Inflammation, alſo Convulſion, and even Death itſelf has been obſerved by ſome Phyſicians to be the Conſequence, unleſs the Bones were ſpeedily replaced. It is therefore the ſafeſt way to reduce the Luxations in theſe Bones of the Foot, by the method we before propoſed for thoſe of the Hands, and that with the greateſt Expedition. So when any of the Bones in the Toes are diſlocated, there is nothing more required than what we propoſed before in thoſe of the Fingers. We are however, in the laſt place, to recommend the Patient to reſt quietly in his Bed for a ſufficient time afterwards.

An EXPLANATION *of the* TENTH TABLE.

Tab. X.

Fig. 1. Is a Sling which may be uſed to make an Extenſion in Luxations of the Head. See the Chapter on Luxations of the Head.

Fig. 2. Is another Sling, to retain the Patient's Body firm in the ſame Caſe.

Fig. 3. Shews the moſt commodious Method of reducing a recent Luxation of the *Humerus.*

A Is the *Patient*, ſeated ready to undergo the Operation.

B Is

Plate

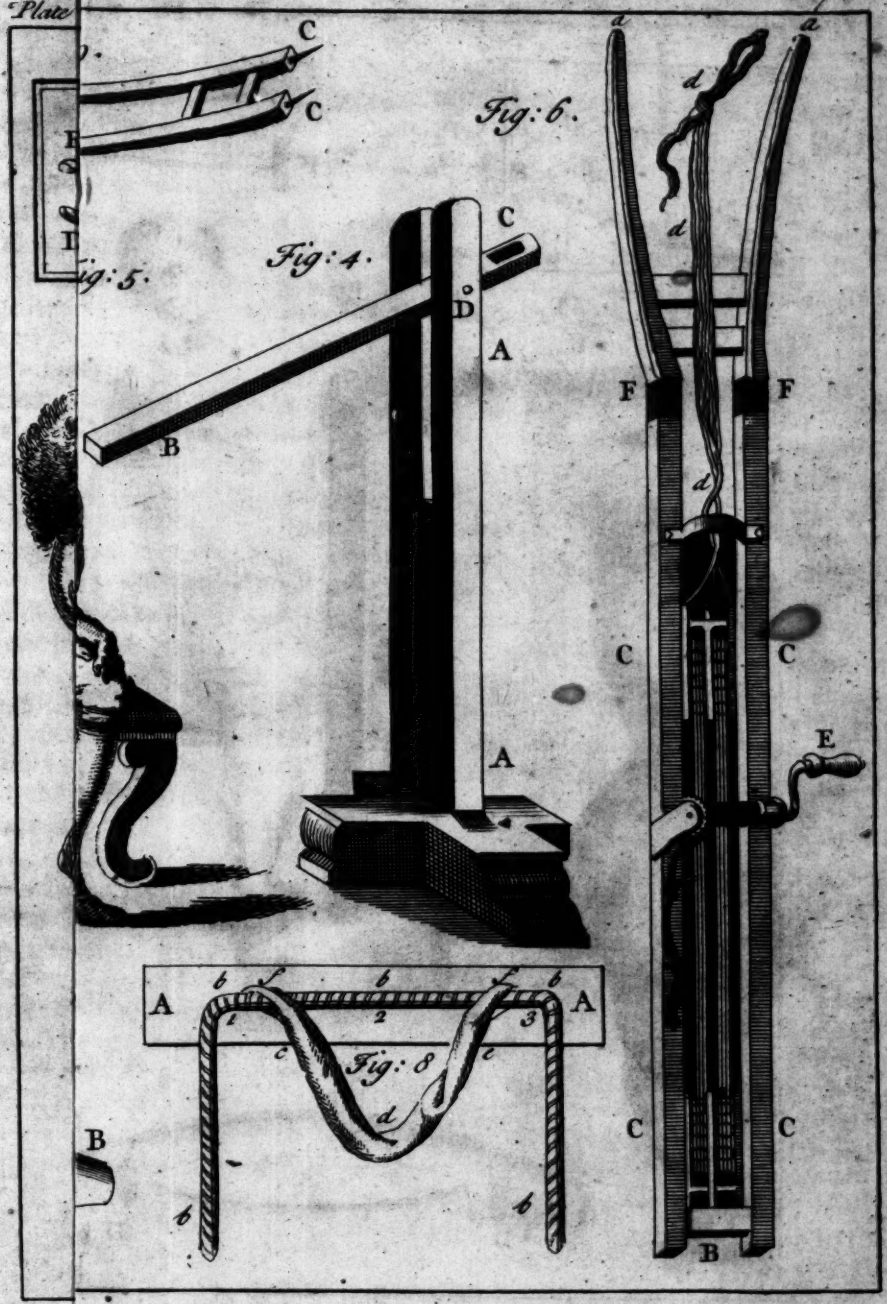
C
C
Fig: 5.
Fig: 6.
Fig: 4.
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Plate 10.

Fig: 1.

Fig: 2.

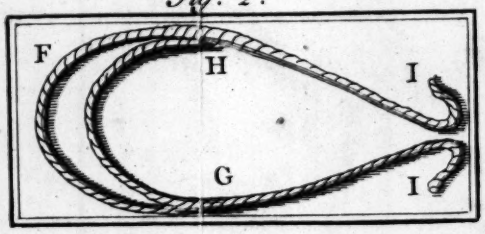
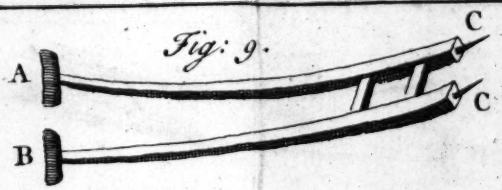


Fig: 9.



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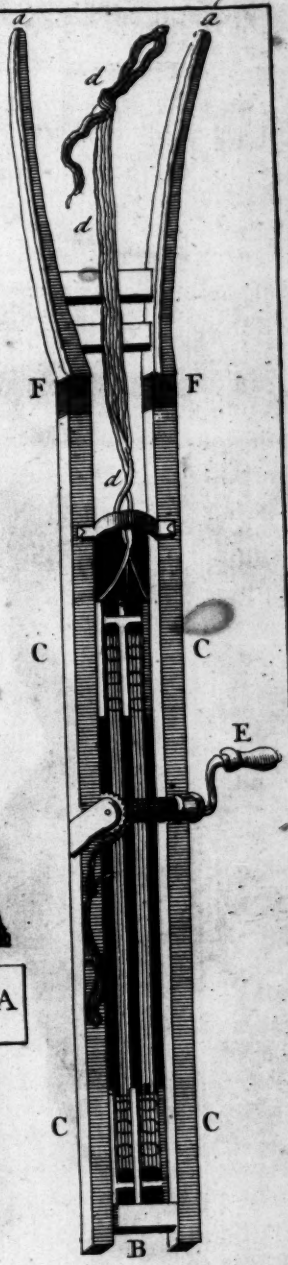

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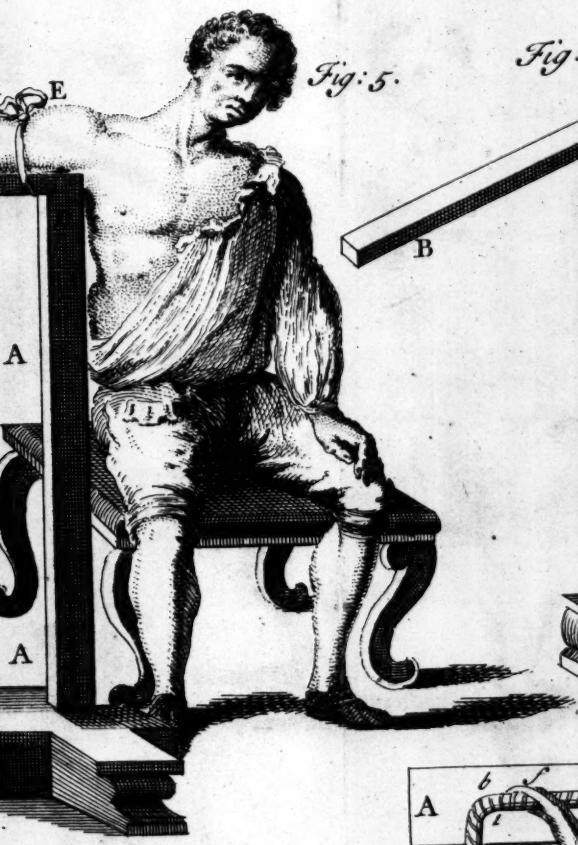
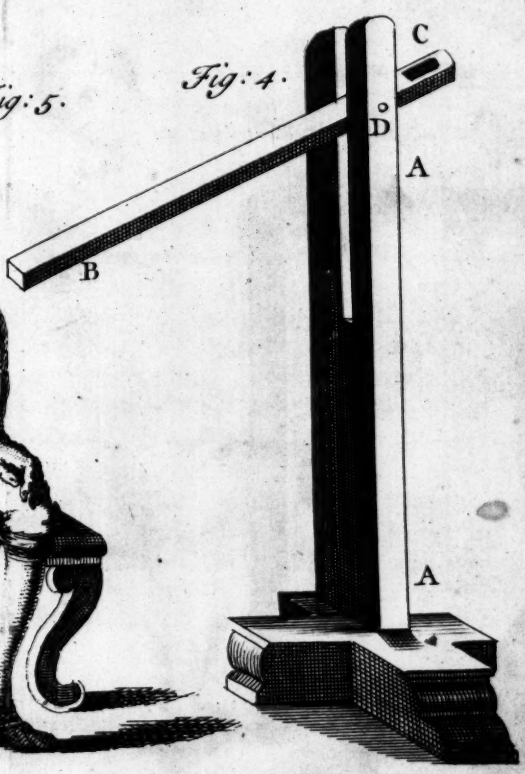


Fig: 4.



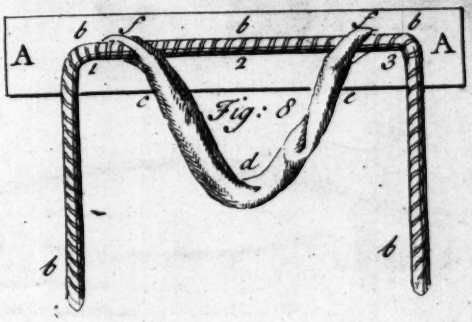


Fig: 8.

Fig: 7.

How a Contusion of the Ancle is to be treated.

A Contusion of the Ancle sometimes difficult to cure.

Luxation of the *Calcaneum*.

Luxation of the other Bones of the Foot.

Tab.

B Is the *Aſſiſtant* that holds the *Patient* firm in his Seat.

C Is the *Aſſiſtant* that extends the diſlocated *Humerus*.

D The *Surgeon*, reducing the diſlocated *Humerus*.

E A Napkin, whereby the Surgeon elevates the Arm in order to its Reduction.

Fig. 4. Is a Machine commonly called the *Ambe* of HIPPOCRATES, uſed formerly to reduce Luxations of the *Humerus:* It conſiſts of the *Fulcrum* A A, to which is faſtened the moveable Lever B C, joined to each other by a ſort of moveable Articulation D.

Fig. 5. Shews how the former Inſtrument is to be applied to a Luxation of the *Humerus*. There is ſome Difference between the Structure of this and the former, at the Joint C D, ſome think this is preferable to the laſt.

A A is the *Fulcrum*, B C the Lever, to which the luxated Arm is faſtened by the three Ligatures E E E. D the Place where the *Fulcrum* and Lever are faſtened together by a moveable Joint. When the end of the Lever B is preſſed downwards, the luxated Arm is extended, and lifted up near its *Scapula*.

Fig. 6. Is PETIT's Machine for reducing Luxations of the *Humerus*, and ſeveral other Luxations.

a a are two Arms or Horns by which the Patient and particularly his *Scapula* is held firm, from giving way in the Extenſion; B the other end of it, reſting upon the Ground or Floor; C C Pulleys of the Machine; *dd* the Rope, by winding up which, an Extenſion is made; E the Handle, which being turned round, draws the Rope tight, and extends the Limb; F F the Place where the two Horns are joined to the Body of the Machine.

Fig. 7. Is a *Retinaculum* or Supporter, to be uſed in a Luxation of the *Humerus*. A an Opening or Slit in the Machine; B C the Form of it at each end; D D two Apertures, through which the two Legs or Horns *a a* of the Inſtrument *Fig.* 6. are to be paſſed.

Fig. 8. Is a particular Sling of Mr. PETIT's, proper for extending luxated Limbs. A the Part made with Leather; *bbb* a Silk Ligature, ſewed to the Leather in three Places at 1, 2, 3. the Part A A is faſtened round the Arm; *c d e* is a ſtrong Loop faſtened to the Silk Ligature at *f f* ſo as to be moveable.

Fig. 9. Is an Inſtrument recommended by PETIT for the Reduction of a luxated *Femur* when diſlocated forwards. It is to be faſtened at F F in the Machine *Fig.* 6. inſtead of the two Arms *a a*. The Part A is applied to *Os Ileum*, and the Part B to the middle of the Thigh; but C C are fixed into the Machine *Fig.* 6. at F F.

THE

THE FOURTH BOOK OF THE FIRST PART. OF TUMORS.

CHAP. I.

Of TUMORS *in general.*

A Tumor what.

I. ANY Part of the Body which is preternaturally enlarged is by Phyſicians called a *Tumor*. But whether there be any ſuch Enlargement, in what Part it exiſts, and of what kind it is, may be diſcovered by examining the Parts, not only by Inſpection, but more particularly by Feeling. And notwithſtanding it has been the general Cuſtom to refer *Excreſcences*, as Warts, Corns, and ſuch as grow in the Noſe and *Pudenda*, to the Claſs of *Tumors*; yet becauſe they grow not from beneath, but out of or upon the Skin itſelf, it ſeemed proper here to treat of them ſeparately from Tumors. We ſhall take notice of the moſt remarkable Excreſcences, when we treat of Chirurgical Operations.

Kinds of Tumors.

II. There are Tumors of various kinds, diſtinguiſhed by particular Names, according to the different Cauſes from whence they proceed, and the particular Parts wherein they are ſeated. Some are called *hot*, others *cold* and *watry*; ſome again are termed *windy*, others *ſcirrhous*; laſtly, ſome are named *benign*, others *malignant*; but theſe Diſtinctions obtain chiefly with the weaker ſort of Phyſicians. There are ſome Tumors which are contained in a proper membranous Bag, and are therefore called *Cyſtic*; and if this ſhould be in an Artery, it is uſually termed an *Aneuriſm*; but when in a Vein, a *Varix*; when in the Veins of the *Anus* or *Rectum*, the Diſorder is termed *Hæmorrhoides*; but if the Tumor be in the *Scrotum*, *Inguen*, or at the *Umbilicus*, it is generally called a *Hernia*; if any *Pus* or Matter is contained in the Tumor, it is then by the Surgeons termed an *Abſceſs*. Laſtly, if the Tumor is ſeated on a Bone, Phyſicians uſually call it an *Exoſtoſis*.

Kinds of Inflammation.

III. The forementioned Claſſes of Tumors are all of them generally ſubdivided into ſeveral other kinds: Thus the hot and burning Tumors, which are the ſame with

with Inflammations, are generally termed *Phlegmons*, when violent, and ſeated in the common Integuments; but when ſlighter, they are commonly called *Furuncles*. The Inflammation which is not fixed deep, but ſpreads only ſuperficially upon the Skin, is uſually diſtinguiſhed by the Name of an *Eryſipelas*; and the inflammatory Tumor that ariſes at the Fingers Ends is termed *Paronychia*; when the Inflammation fixes in the Groins or Arm-pits, the Tumor is called a *Bubo*; but when under the Ears, *Parotis*. If a great Inflammation ſeizes the Hands and Feet from extreme Cold, *Childblains* ariſe. Other Inflammations have alſo particular Names, according to the particular Part of the Body they poſſeſs: Hence in the Writings of Phyſicians we frequently find Accounts of an Inflammation of the Breaſts, Eyes, Tonſils, Teſticles, Arms, Feet, *&c.* And this may ſuffice for a ſhort and general Account of the kinds of Inflammations; the various other ſorts of Tumors we ſhall explain hereafter.

IV. Before we proceed farther into the Conſideration and Treatment of Tumors, it will be firſt proper to take Notice that we do not intend here to handle all ſorts of Tumors to which the Human Body is ſubject; but only ſuch as are external, and of the ſlighter kind. We intend firſt to examine thoſe Tumors only which are to be cured by manual Operation, and topical Remedies, and ſo come properly under the Buſineſs of Surgery; neglecting at the ſame time ſuch Tumors whoſe Cure is to be expected chiefly from the uſe of internal Medicines; as is uſual in ſome internal Inflammations, *Scirrhus*'s, Dropſies, and the like. We ſhall alſo refer thoſe Tumors which require Inſtruments and great Skill in their Treatment, to the Part of Chirurgical Operations; ſuch are *Herniæ*, *Excreſcences*, *Strumæ*, *Scrophulæ*, the *Paronychia*, *Cyſtic Tumors*, *Aneuriſms*, *Varices*, *Hæmorrhoides*, and others; ſo that our chief Concern here will be to treat of *Inflammations*, *Scirrhus*, *Cancer*, *Œdema*, *Tumors of the Joints*, and other external Tumors. We begin with Inflammations.

CHAP. II.

Of a PHLEGMON.

I. A *Phlegmon* or external Inflammation is when any outward Part of the Body is preternaturally enlarged, and attended with a burning Heat, Pain, Redneſs, Reſiſtance, and a continual Pulſation and Pricking. Upon a due Conſideration whereof, we may pretty readily perceive the Reaſon why the Diſorder came to be diſtinguiſhed by this Name. If we enquire into the proximate Cauſe of this Inflammation, we ſhall find it generally riſes from too thick or viſcid a State of the Blood, ſtagnating in the *Anaſtomoſes* of the ſmalleſt Arteries and Veins; ſo that the Blood being ſent in larger Quantities than it can paſs through thoſe Veſſels, muſt of conſequence excite the forementioned Symptoms, and muſt occaſion great Diſorder at every Part where ſuch Stagnation is made. And though no Part of the Body, whether external or internal, nor the Bones themſelves are exempt from this kind of Inflammation; yet it more frequently happens in the Fat and Glands than elſewhere. What a *Phlegmon* is.

II. We juſt now obſerved, that the immediate Cauſe of this Inflammation was an Obſtruction or Stagnation of the Blood in the ſmalleſt order of Veſſels: Cauſes (1.) external:

But if we enquire into the Cauſes from whence that Inſpiſſation and Stagnation of the Blood in thoſe Veſſels proceeds, we ſhall upon Examination find them to be of two kinds; of which, the firſt ſort may be called external, and the latter internal. Amongſt the *external Cauſes*, we place in the firſt Rank all Wounds, Fractures, Luxations, Contuſions, Punctures by Thorns and Splinters, with a too great Compreſſion of the Veſſels, whether by too ſtrict a Bandage, or otherwiſe; each of which obſtruct the Paſſage of the Blood through its minute Veſſels, by either dividing, bruiſing, compreſſing, or diſtorting them. To the foremen-tioned Cauſes we muſt add Burns of all ſorts, extreme Cold, too violent Motion of the Body, the external or internal Application of ſharp and ſtimulating Sub-ſtances, ſticking Plaſters, oily and fat things, with abundance of the like nature, which ſtop up the inviſible Pores of the Skin, and impede the free Courſe of the Blood.

(2.) internal.

III. Amongſt the *internal Cauſes*, we reckon any thing acrimonious in the Fluids, as in the Scurvy; becauſe theſe ſo irritate, corrode, prick, and contract the very ſmall Veins and Arteries, that the Blood is thence by degrees obſtructed in them. But the ſame alſo frequently happens from the Blood abounding in too *great Quantities*, or being of *too thick a Conſiſtence*; or laſtly, when it circu-lates in the Body with *too violent a Motion:* For by this means the groſſer Particles of the Blood are drove, and, as it were, wedged into much ſmaller Veſ-ſels than they can readily find a Paſſage through; and this more eſpecially when a ſudden Cold is ſpread over a Body that is in a great Heat. In ſhort, every thing will produce an Obſtruction, which makes the Parts of the Blood too groſs and bulky, or too much contracts the Mouths of the ſmall Veſſels.

What Share an Acid and Fermenta-tion have, as Cauſes.

IV. As this is the ſtate of the Caſe, with regard to the Cauſes of Inflamma-tion, I think, the Opinion of ſome modern Surgeons, who ſuppoſe the chief and ſole Cauſe of the Obſtruction to be an *Acid* in the ſmall Veſſels, appears to be very evidently erroneous. For beſides their Inability to diſcover whether and where this Acid hides itſelf, it is very apparent from what we have here deli-vered, that great Obſtructions may be brought on by a long train of very dif-ferent Cauſes. The ſame may be ſaid with regard to *Fermentation*, which has been formerly patroniſed by many as a grand Cauſe in Inflammations and Ob-ſtructions; for there could never yet be found any ſuch Fermentation in the Blood.

The Symp-toms of In-flammation.

V. We obſerved at §. 1. that an Inflammation was generally attended with Tumor, Heat, Redneſs and Pain, and very often with a Reſiſtance and con-ſtant Pulſation. To inveſtigate the Cauſes of which Symptoms, we ſhall meet with no great difficulty, if we ſtrictly and accurately examine the Diſorder itſelf. When the Blood is obſtructed in its Paſſage through ſome of its ſmalleſt Veſſels, it muſt neceſſarily move faſter through the reſt; for the ſmalleſt Arteries are never all obſtructed, but in a *Sphacelus:* The general Conſequence then muſt be, a ſwifter Circulation of the Blood through all its other pervious Veſſels in the Bo-dy; hence the Arteries muſt beat quicker, ſwell larger, and thence excite great Heat. When we find a Patient in this State, we may ſay he has a ſmall Fever; which is uſually accompanied, for the firſt Days, with Thirſt, Head-ach, Reſt-leſsneſs, and the other common Attendants of a Fever. If we bleed the Patient in this Caſe, when his Blood is cold, it appears covered with a tough and whi-tiſh Cruſt or Skin, not greatly unlike the Skin of freſh Pork. As the Diſeaſe

and

and Heat encreaſe, each of theſe Symptoms become more violent; till at laſt, the whole Maſs of Blood being deprived of its moſt fluid Parts, is converted into a tough and glutinous Body, as will be more apparent from our Obſervations at the Operation of Bleeding.

VI. Inflammations terminate variouſly according to their different degrees of Violence; the Cauſes from whence they ariſe, the Parts which they affect, and the particular Conſtitution of the Patient, with ſeveral other Circumſtances, which alſo preſage to us what will be the End of the Inflammation. But the ſeveral ways wherein an Inflammation terminates, are chiefly four: It is either (1.) ſo *diſperſed* and *reſolved* as to vaniſh without leaving any conſiderable Injury in the Part affected, which afterwards recovers its former Vigour, and is of all the beſt courſe it can take; or elſe (2.) the Inflammation ſuppurates and degenerates into an *Abſceſs*, ſo as to leave ever after ſome Damage in the Organ; or elſe (3.) the Inflammation degenerates into a *Gangrene* or *Sphacelus*; or (4.) laſtly, into a very hard Tumor, commonly called a *Scirrhus*, which grows more compact in the Part affected as the Inflammation remits or goes off.

The ſeveral ways by which an Inflammation terminates.

VII. As to the Reſolution or *Diſperſion* of an Inflammation, that is uſually practicable when it is only of a milder kind; in a ſound Habit of Body, when the Blood is not yet too viſcid nor vehement in its Motion. But *Suppuration* follows when the Inflammation is more violent, the Circulation more rapid, but yet the Maſs of Blood ſomewhat temperate and without much Acrimony; that is, when the Blood becomes more inſpiſſated, and its larger Particles ſticking in the minute Veſſels can find no Paſſage, by which means the very ſmall Veſſels are diſtended and burſt by the Preſſure and Impulſe of the obſtructed Blood, ſo that their contents are extravaſated in the Fat, Fleſh, and adjacent Parts. Upon this Extravaſation the more ſubtile Parts of the Fluids putrify by the great Heat, they become fœtid, acrimonious, and corrode the adjacent Parts. The Fluids thus changed and corrupted, are then by the Surgeons called *Pus* or Matter; of which there are ſeveral kinds, according to its different Colour and Conſiſtence; being either white, yellow, greeniſh, reddiſh, or party-coloured.

How it may be (1.) diſperſed, or (2.) ſuppurated,

VIII. The Inflammation generally terminates in a *Gangrene* (which Celsus and the *Latins* term *Cancrum*) when the forementioned Symptoms are much more violent, and when the Blood is at the ſame time more acrimonious and rapid than it ought to be: For in that Caſe, the ſmalleſt Arteries and Veins are corroded, and burſt or broke; hence all the adjacent Parts are diſſolved and corrupted by the acrimonious and extravaſated Humours; and particularly the Skin is very ſubject to be filled with Puſtules, when its *Cuticle* has been ſeparated, as in Burns. The *Sanies* contained in theſe Puſtules and elſewhere, is uſually termed *Ichor*, which is generally of a pale reddiſh Caſt, being ſometimes fleſh-coloured, and ſometimes brown or livid, which is the worſt of all: For unleſs the Patient in theſe Circumſtances be timely aſſiſted, the forementioned Symptoms of Inflammation go off, the Tumor, Reſiſtance, Heat, Redneſs, Pain, and Pulſation gradually diſappear, and the afflicted Member grows flaccid and cold; it afterwards turns pale, becomes dead and inſenſible, and the Inflammation creeps to ſome other Part. If this Caſe ſhould chance to be treated with Medicines too hot, aſtringent, cooling, fat, acrimonious, or narcotic; or if the Parts ſhould be bound up too tight, the Fleſh then quite dies, its Paleneſs

or end in (3.) *Gangrene*, or (4.) *Scirrhus*.

turns to a livid or leaden Colour, ſometimes reſembling the Rind of Bacon. In the mean time, the incloſed *Sanies* finds no Vent, becomes more acrimonious, and ſo greatly corrodes the adjacent fleſhy Parts, as wholly to deſtroy all Senſe and Motion throughout the Limb, whereupon follows a *Sphacelus*, or entire Corruption of the Member: But if the inflamed Part be full of Glands, and the Blood very thick, glutinous, and inſpiſſated; the ſmall Blood Veſſels are then ſo ſtrongly ſtuffed up with the glutinous Blood, that they are compacted together, the Parts loſe their Senſation, and are converted into a *hard* Tumor, which is thence called a *Scirrhus*. This may be ſufficient concerning the four ſeveral ways wherein a *Phlegmon* may terminate; but it remains that we ſhew the particular Method of Treatment and Cure proper in each of thoſe Stages.

Of the Reſolution or Diſperſion of Inflammations.

In what a Diſperſion thereof conſiſts.

IX. Though the Methods uſed to cure Inflammations may be various, according to the ſeveral Cauſes and ſupervening Symptoms, with other various Circumſtances; yet, as the Inflammation conſtantly ariſes from an Inſpiſſation of the Blood in its ſmalleſt Veſſels, the grand Intention of each of thoſe Methods ſhould be, to open ſuch ſmall Veſſels as are obſtructed, and to reſtore the Blood to its natural Conſiſtence and free Circulation. This has been commonly termed Reſolution or Diſperſion. Therefore whenever the inflammatory Signs mentioned §. 7. are gentle, it is much the beſt way ſpeedily to conclude about diſperſing it; the right Method of performing which we are now going to lay down.

Removal of the external Cauſes.

X. If the Cauſe of the Inflammation is found to be external and obvious to the Senſes, as Thorns, Splinters, the End of a Sword, Bullets, or any other foreign body ſtuck in the Part; nothing can be more ſerviceable than to ſpeedily and carefully remove whatever is lodged there, if it can be done with Safety. So alſo when the Inflammation proceeds from a too ſtrict Bandage in Wounds, *&c.* or from a Luxation or Fracture; the firſt and principal buſineſs is to ſpeedily relax the Bandage, or elſe to ſet the Fracture or reduce the Luxation.

Bleeding and Purging to be uſed.

XI. When the external Cauſes are once removed, and when the Inflammation is great and proceeds from internal Cauſes, it is in both Caſes very uſeful to open a Vein either in the Arm or Foot, and to draw off a large Quantity of Blood, proportionable to the Strength and Habit of the Patient; giving afterwards a briſk Purge, not one that heats the Body, but judiciouſly accommodated to the Age and Conſtitution of the Patient. Both theſe are very neceſſary here, and if the Symptoms do not remit and grow milder, they muſt be repeated at Diſcretion: But I would adviſe the Surgeon in this Caſe, where he can, to call in the Advice of ſome prudent Phyſician; becauſe it may be otherwiſe carried on to exceſs, as many do among the *French*, or elſe not made ſufficient to anſwer the Intention. The moſt proper Purges for theſe Caſes, we have mentioned before (at *Book* I. *Chap.* XV. §. 14, *ſeqq.*) in ſpeaking of Inflammations ariſing from Contuſions. But in very mild Inflammations, or where the Patient is of a weak Habit, or has loſt much Blood by a Wound, or any other Cauſe, Phlebotomy and even Purging itſelf ſeems to be quite improper: On the contrary, when the Inflammation is great, and the Patient ſtrong, it is almoſt incredible of what great Service a prudent Adminiſtration of laxative and diſcutient Medicines may prove.

XII. To

XII. To reſolve and attenuate the inſpiſſated Blood in the ſmall Veſſels, exceeding great Benefit will be found by giving internal Medicines, which are watry, diluent, cooling, and attenuating; becauſe Bleeding alone, which the *French* rely too much upon, is frequently inſufficient, unleſs it be joined with a proper Regimen and Diet; by which means any Acrimony in the Blood may be mollified and taken off. But all Aliments which are of a difficult Digeſtion, ſuch as are pickled or ſalted, with all Spices and fermented Liquors, or any thing elſe that may heat the Blood, are to be ſtrenuouſly and altogether avoided. Such internal Medicines are moſt proper here to cool and qualify the Blood, as are commonly given with Succeſs in continual ardent Fevers, or internal Inflammations, as the Pleuriſy, Meaſles, *&c.* Such are the abſorbent Powders of *Lap. Cancror. Conch. pp.* neutral and nitrous Salts, cooling and diaphoretic Mixtures and Julaps, made of diſtilled Waters, ſubacid Juices and Syrups, alſo thin Emulſions made of the four cold Seeds. But the bezoartic and ſpirituous Tinctures preſcribed and recommended by ſome in this Caſe, are ſo far from being ſerviceable, that they encreaſe the Inflammation in the Blood, and make a new Fire. Internal Medicines proper.

XIII. With regard to the particular Regimen and Diet, the moſt proper *Aliment* ſeems to be Broths and Drinks, made with Barley, Oats, or Flower, alſo Viper's Graſs, Succory, Chervil, Sorrel, Lettice, Endive, Apples, and Vegetables of the like nature: In the Decoction of which may be mixed the Juice of Citrons or Vinegar, to communicate a grateful Sharpneſs, and temperate the inflammatory Heat. Hence roaſted Apples, or Cherries and Plumbs boiled are very wholſom for inflammatory Caſes, where they ſit eaſy upon the Stomach. The moſt proper *Drinks* are ſuch as are thin, watry, and cooling, made of a Ptiſan or Decoction of Barley, Oats, or Bread: And to give it a pleaſant Taſte, Apples may be uſed, or ſome acid Syrup; but when the Inflammation is violent, it will be proper to add a ſmall Portion of Nitre: Of theſe may be drank plentifully, in Proportion to the Thirſt and Heat; but Care ſhould be taken not to let the Patient overdrink himſelf. Ale and ſtrong Wine ſhould be wholly abſtained from; but if they are of the ſmalleſt ſort, and the Patient has a ſtrong Deſire for them, he may be gratified without any great Danger; eſpecially if a Slice or two of a Citron be infuſed therein. Beſides the foregoing, it may be not amiſs, for variety, to uſe Coffee and Tea, *&c.* If the Patient ſhould happen to be of a cold and phlegmatic Habit, it may be not improper to add ſome of the milder ſort of Spices to his Drink, as Cinnamon, Saſſafras, Mace, Aniſeeds, and the like; or the Patient may be ordered to infuſe ſome proper medicinal Herbs in the manner of Tea, or a very weak Decoction of Saſſafras, the drinking of which will promote a gentle *Diaphoreſis* or Perſpiration: For by this means whatever is glutinous in the Blood will be readily attenuated and reſolved, and the Blood will recover its free Circulation. A regular Diet to be obſerved.

XIV. Nor is there leſs Care required in the Application of *external Medicines*. For though ſome Phyſicians uſe nothing but heating Remedies, and others only cooling Medicines, to appeaſe the Inflammation; yet both of them; when applied indiſcriminately, may prove both uſeleſs and pernicious: For one Medicine is not to be applied to every Patient, but particular Remedies are to be ſuited to the Strength and Conſtitutions of particular Patients; or elſe Injury might follow from the Application of hot Medicines to hot Conſtitutions, and the contrary. External Medicines.

contrary. I therefore look upon it to be matter of Conſequence to obſerve diligently, that cooling Medicines be applied to ſuch as are of a hot Temperature. Among the Coolers, the principal are *Acetum Lithargyriſatum* applied warm by Linen Rags folded together, or *Acetum calidum Minio Bolóve permixtum*, or *Oxycratum ex æquis Aceti & Aquæ portionibus confectum.* Of each of thoſe Liquors may be taken, for example, ℥vj. *Salis communis* ℥j. *Nitri vel Salis Ammoniaci* ℥ij. let them be mixed and applied to the affected Limb with Linen Cloths. Among the vulgar, common, or domeſtic Medicines, the *Stercus bubulum recens atque calidum Aceto calidiori admixtum*, is an Application very eaſy to be had, and of no ſmall Efficacy; Pickled Cabbage Leaves, Broth, Brine, *&c.* are alſo ſometimes uſed with Succeſs to the inflamed Limb. Some prefer cooling Emplaſters, as the *Emp. ad Ambuſta*, *de Minio*, *de Lithargyro*, *Diapompholygos*, *Saturninum*, *&c.* Theſe Plaſters may do pretty well in the ſlighter Inflammations, for ſuch Patients as have a good Opinion of Plaſters; particularly they will do very well in the Night-time, when the Preparation and Application of Fomentations are difficult and troubleſome.

Remedies proper in cold or phlegmatic Habits.

XV. In cold and phlegmatic Patients, the *Sp. Vin. rectificat. Sp. Vin. Camph. vel pauxillo Theriac. permiſt.* are very ſucceſsful in diſperſing Inflammations, being often applied by means of hot Cloths; ſo is alſo the *Aq. Calcis*, *vel mera*, *vel cum Sp. Vin. Camph. Aq. Reg. Hungar. Bolo*, *Ceruſſâ*, *Lap. Calaminari*, *Sale Ammoniaco*, *aut Lithargyro permixta.* A Mixture of *Sp. Vin.* ℔j. and *Sapon. Venet. vel Hiſpan.* ℥ij. being applied warm, gives place to hardly any Medicine for diſperſing an Inflammation. Laſtly, there are many Herbs proper for this Purpoſe, as *Scordium*, *Abſinthium*, *Mentha*, *Sabina*, *Abrotonum*, *Matricaria*, *Flor. Tanaceti*, *&c.* which may be diſcretionally made into a Decoction with *Aq. Salſa*, *Marina*, *vel Calcis.* With this Decoction may be mixed *Sp. Vin. Rect. vel Camph. & Sap. Venet.* by which means its Virtue will be increaſed. The forementioned Herbs may be alſo commodiouſly boiled and made into a Cataplaſm, and applied in the ſame manner with the reſt of the Medicines, *i. e.* by Linen Cloths folded together and bound round the diſordered Member.

External Applications how to be made.

XVI. There remains one thing to be eſpecially obſerved, with regard to the Application of external Medicines in this Caſe; namely, that each of them muſt be always applied hot, and never be permitted to grow firſt cold. The Inflammation alſo diſperſes generally much more ſpeedily, when the diſordered Limb is firſt rubbed well with a Cloth dipped in ſome warm diſcutient Fomentation, before any freſh Cataplaſm be laid on: And this Method is to be continued till the Inflammation be either wholly diſperſed, or elſe brought to an End by Suppuration or a Gangrene.

What ſort of Life the Patient ſhould live.

XVII. In the mean time the Surgeon ſhould carefully obſerve that the Apartment where the Patient lies be neither too hot nor too cold, but be kept as near as poſſible to the degree of temperate Air. Alſo to reconcile Reſt and Sleep to the Patient, and to let him not be kept awake too long. Laſtly, to let the Patient keep his Mind free from pernicious Paſſions, as Anger, Fear, Care, great Thought, *&c.*

CHAP.

CHAP. III.

Of SUPPURATION *and* ABSCESS.

I. WE obſerved before, that the ſecond way in which an Inflammation went off, was by Suppuration; that is, a converſion of the inſpiſſated Blood and the ſoft adjacent Parts (as the ſmall Veſſels and Fat) into *Pus* or Matter; which Diſorder, when it has not yet found an Opening, is generally called by Surgeons an *Abſceſs*. Suppuration what.

II. An Inflammation may be known to tend to Suppuration from the Signs before mentioned at *Chap.* II. §. 7. which generally happens when the Inflammation has been of long ſtanding when the Surgeon is called in, or when it cannot be diſperſed by the uſe of the fore-cited Remedies. Signs of Suppuration.

III. As ſoon as we find it tend to Suppuration, we muſt wholly lay aſide the uſe of reſolving Medicines, and we muſt ſtrive, (1.) to forward the Inflammation to Maturity, *i. e.* to convert the ſtagnating Blood into laudable Matter; then (2.) to procure a Diſcharge or Vent for this ſuppurated Matter; (3.) to let the diſordered Part be well cleanſed from all that is corrupted; and laſtly, (4.) to incarn, agglutinate, and heal the wounded Part. What is to be done in Caſe of Suppuration.

IV. As to forwarding the Inflammation to *Suppuration*, that is to be promoted by particular maturating Remedies. Among which, the beſt ſeem to be ſuch of the Emollients as obſtruct the Pores of the Skin, as Fats, Oils, glutinous and ſlippery Medicines; as alſo the Application of ſharp, pungent, and ſomewhat cauſtic Medicines, made up and uſed in the Form of a Cataplaſm, or Plaſters of the like kind may be applied to the diſordered Part. Maturation, how promoted.

V. Among the emollient Medicines for this Purpoſe, there are ſeveral kinds of Herbs, Fruits, Seeds, and Meals that may be here enumerated; as the *Althæa, Malva, Hyoſciamus, Ficus, Semen Lini, Fænum Græcum ejuſdémque ſeminis Farina; Farina item triticea aut ſiliginea, Panis primarii & ſecundarii Micæ, Vitelli Ovorum, Butyrum, Mel, variorúmque animalium pinguedines vel adipes, Oleum Lini, Liliorum alborum, Chamæmel.* and many others of the like kind. As to the other Claſs of Maturaters, which are ſharp, pungent, and ſtimulating, but alſo emollient at the ſame time, we may reckon *Chamæmelon, Melilotum, Cepæ ſub cinere toſtæ, Allium, Crocus, Terebinthina, variáque Gummata, Galbanum inprimis, Ammoniacum Bdellium, Opopanax, Sagapenum in vitellis ovorum reſolutum, & denique fermentum panis.* Simple maturative Remedies.

VI. From a proper Mixture of the now recited Simples, may be made various and uſeful Cataplaſms and Plaſters for this Purpoſe. It may be not unacceptable here to inſtance a few of the moſt proper and efficacious of theſe compound Maturatives: Compound Maturatives.

1. ℞ *Herb. Malv. Alth. Parietar. Chamæmel. ana* M j. *Farin. Sem. Lini vel Fænugræci* ℥ ij. *Coq. leni igne aquâ vel lacte, ad conſiſt. Cataplaſmatis, poſtea add. Fermenti* ℥ ij. *Gum. Galban. in vitell. ovi reſoluti* ℥ j. *Atque linimentorum convolutorum adminiculo, calida, & quàm ſæpiſſime quidem ſupra læſum membrum deligantur. Vel,*

2. ℞ *Fol.*

2. ℞ *Fol. Malv. Branc. Urſin. ana* Mij. *Caricar. pinguium contuſar. N°.* vj. *His eâdem, ut modo retulimus, ratione decoctis adde butyri recentis, nec non cepæ ſub cineribus toſtæ, æquis portionibus* ℥ ij. *& denique farinæ ſem. lini, quantum quidem ad Cataplaſma conficiendum ſufficit, admiſcendum. Vel,*

3. ℞ *Rad. Lilior. alb.* ℥ ij. *Herb. Parietar. Mercurial. Melilot. ana* Mj. *Ficuum recent. contuſ. N°.* vj. *Hæc in aquâ penitus concoquantur, admixtiſque Gumm. Ammoniac. & Sagapen. in Vitellis ovorum ſolut. ut & Aceti boni ana* ℥ j. *oleique lini* ℥ j. ß. *in Cataplaſma quoddam convertantur. Vel,*

4. ℞ *Farinæ Siligineæ, aut Triticeæ* M ij. *vel* iij. *coq. in ſ. q. lactis, admiſc. Gumm. Bdellii & Opopanacis cum vitellis ovor. ſubactor. ana* ℥ j. *ut & Croc.* ℥ j. *in Cataplaſma tranſmutentur. Vel,*

5. ℞ *Fermenti* ℥ iij. *Mellis* ℥ j. *Saponis Veneti comminuti* ℥ ß. *Olei Lilior. alb. q. ſ. F. Cataplaſma. Vel,*

6. ℞ *Mellis* ℥ iv. *ad lentum ignem ex aquâ decoquantur; his poſtea Olei Lini aut Chamæmel. pauxillum, ut & Farinæ Siligineæ aut Sem. Lin. quantum ad malagma parandum ſatis eſt, admiſceatur.*

Theſe Cataplaſms, or others of the like nature, are to be often applied hot to the Part affected, till the Matter within appears to be ſufficiently digeſted or maturated by the Softneſs and Whiteneſs of the Tumor. But when the Abſceſs is of the ſmaller kind, it is every way more commodious to apply ſome maturative Emplaſter, as *Empl. Diachyl. cum Gumm. vel & Emplaſtrum ex melle & farinâ compoſitum*; theſe may be applied to the Part affected till Suppuration enſues.

Internal Medicines proper to be uſed.

VII. In the mean time, when the Patient's Condition requires it, we muſt be careful to temperate the Blood's Motion, not by external Applications only, but alſo by internal Medicines and a proper Regimen. When the Blood moves too ſlowly, as may be known by the Pulſe, the Patient ſhould moderately uſe Meat, Drink, and Medicines which are warm and ſtimulating: By which means the inſpiſſated Blood contained in the ſmall Veſſels may be the more eaſily converted into Matter, by the increaſed Motion of the Blood. Strong Broths, Wines, and Ale are alſo very effectual for the ſame Purpoſe. But where theſe are inſufficient, and the Pulſe indicates that the Motion of the Blood is ſtill ſlower, it will be proper to order the *Theriaca, Diaſcordium*, or *Alkermes* to be taken a Bit upon the Point of a Knife ſeveral times in a Day, or diſſolved in Wine, Cinnamon Water, or ſome other Cordial Liquor; in the mean time we muſt not neglect the *Tinctura Bezoart. Eſſent. Diaphoret. Eſſent. Cinnam.* with other warm cardiac and comfortable Eſſences, Spirits, and medicated Teas, by infuſing a few Saſſafras Chips, Red Sanders, Cinnamon, *&c.* But on the contrary, when the Motion of the Blood appears by the Pulſe and great Heat to be too violent, then cooling Medicines muſt be directly ordered, to aſſwage and temperate the great Heat and Motion. To this Head belong all ſorts of thin and watry Drinks, with ſubacid Medicines and abſorbent Powders with Nitre, as we mentioned in *Chap.* II. §. 11. It is alſo frequently proper in this Caſe to open a Vein, and bleed a little. Laſtly, When the Strength of the Conſtitution is not impaired but remains firm, and the Motion of the Blood and Pulſe appear to be neither too ſwift nor too ſlow; unleſs there be ſome urgent Symptom, the

uſe

uſe of internal Medicines to promote the Suppuration, ſeems to be wholly unneceſſary, if the Patient keeps up to a proper Regimen.

When the Abſceſs ought to be opened.

VIII. With regard to opening the Abſceſs and diſcharging its Matter, it is a Caution very neceſſary to be obſerved, that the Opening be not made too ſoon, before the Matter has arrived at a perfect Maturity. For elſe, the Diſcharge of the Matter will be not only impeded, but the Part will, in all Probability, be flung into a greater Inflammation. This has indeed been the common and conſtant Practice hitherto; but ſome of the Moderns (among whom is Goureus a *Frenchman*, p. 259. of his Surgery) will have it proper to open the Tumor directly, without waiting a Suppuration, if it cannot be quickly diſperſed; which I alſo find to have been the Advice of Celsus (p. 408.) formerly. But to return, an Abſceſs is known to be ſufficiently ripe when the Tumor, which before reſiſted, feels ſoft and pliant; it turns pale, or of a yellow Colour; upon applying the Fingers, they will perceive a Fluid to be lodged within ſide, the Pain, Redneſs, Heat, and Pulſation go off, wholly or in Part; and the Senſation of a Heavineſs or Weight ſeizes the diſordered Part in the room of the former. When theſe Signs appear, the Abſceſs muſt be opened in the moſt prominent and depending Part without more delay; for Delay generally proves of a worſe Conſequence than opening it too ſoon, though both of them are bad: For when the Matter is retained longer than it ſhould be, in a large Suppuration and nervous Part, there is Danger leſt the corrupted Matter ſhould corrode the adjacent Parts, and produce *Fiſtulæ*, or a *Caries* of the Bones; or by inſinuating itſelf into the ſmall Veſſels, and corrupting ſuch Parts of the Blood as it mixes with, it may excite ill conditioned Fevers; or laſtly, by diſturbing the Functions of the Brain, Lungs, Liver, and Kidneys, it may bring on Inflammations and Suppurations, and at length Death itſelf. Sometimes the moſt ſubtile Part of the Matter perſpires, and only the groſſer Parts are retained behind, which gives riſe to hard Tumors, eſpecially in glandular Parts. Since theſe muſt therefore be the Conſequences, if the Abſceſs be not timely opened, the Surgeon's great Care muſt be to uſe the proper Opportunity, and to make an Opening by the uſual Methods where the Skin appears to be the thinneſt. The Methods for making this Opening are principally two, either by *Inciſion* with the *Scalpel*, or by making an *Eſchar* with a *Cauſtic*.

How the Inciſion is to be made.

IX. The Parts which are not ſuppurated are to be inciſed in the following manner: The Surgeon is to graſp the Baſis of the Tumor with one Hand, preſſing the Matter outward towards the Skin, to avoid hurting any Veſſels or Nerves in the ſubjacent Parts: He is then to make the Inciſion by the ſharp Scalpel (*Tab.* I. A or B) in his right Hand, making the Opening in the ſofteſt and moſt depending Part of the Abſceſs, that the Matter may have the freer *Exit*. When the Abſceſs is large, the Scalpel is not to be taken out as ſoon as the Opening is made; but the Inciſion in the Skin is to be further enlarged with it, but with ſo much Caution as to avoid the larger Veſſels and Nerves, with the Muſcles of the ſubjacent Parts. The Abſceſs thus opened, the putrid Matter is to be let out, and when it is glutinous and thick it may be gently preſſed forth with the Hands. But if the Quantity of Matter contained be very large, and the Patient not bold enough to bear Thoughts of the Knife, but faints away, which is ſometimes the Caſe; then the beſt way ſeems to be, to diſcharge the Matter in Part, and fill up the Cavity with Lint; and after the Patient has-

been recovered by *Aq. Reg. Hungar.* or ſome other Cordial, to complete the Dreſſing with a Plaſter, Compreſs, and Bandage, leaving the perfect Diſcharge and Cleanſing thereof to the next Dreſſing. But if no *Deliquium* happens, the Matter may be all diſcharged at one time. The remaining Treatment of this Ulcer, is to be the ſame as we have directed before in Wounds. In the firſt place, the Abſceſs is to be cleanſed with Mundificatives or Digeſtives; afterwards Sarcotic or Balſamic Medicines are to be applied till the Wound is fill'd up internally with new Fleſh, and externally cloſed or cicatrized. Tents, particularly of the harder kind, muſt be here cautiouſly avoided, as they generally produce Ulcers which are very difficult to cure. It is much ſafer to fill up the Cavity with Doſſils of Lint, and to remove them once or twice a Day, as there is more or leſs Matter.

How the Matter may be diſcharged by a Cauſtic.

X. The other Method of opening an Abſceſs is by means of a cauſtic or corroſive Medicine, and is generally uſed for Children, and ſuch as are of a tender Conſtitution, who are very much affrighted at the Approach of the Knife or Scalpel for Inciſion. Among theſe cauſtic or corroſive Medicines, the moſt commendable and proper are the *Lap. Cauſt. ex cineribus clavellatis & calce vivâ, vel ex lixivio Saponariorum paratus*; alſo the *Lap. Infernalis*, *Butyrum Antimonii*, and ſuch like: Of which there are ſuch abundance, that almoſt every Apothecary and Surgeon has now his proper Cauſtic, made after his own particular Method, which is ſuppoſed to excel the reſt. The *Lapis Cauſticus* is to be applied to the Abſceſs either whole in the lump, or elſe beat ſmall, as may beſt ſuit the Occaſion; but then a defenſative Plaſter muſt be firſt applied to the Abſceſs, perforated with an oblong narrow Aperture, much as we have delineated in *Tab.* II. *Fig.* 11. For thus a proper Proviſion is made againſt the ſpreading of the Cauſtic beyond its due Bounds, making its way through the Skin only in a ſmall or narrow Compaſs. Over the Cauſtic is to be applied a Compreſs of Lint or Linen, over the Compreſs a large Plaſter, and over the Plaſter a ſtill larger Compreſs of Linen; and to keep all on firm, a proper Bandage muſt be applied. Things being thus managed, the Patient is to compoſe himſelf to Reſt for a while, and the Dreſſing ſhould not be taken off from the Abſceſs for the ſpace of ſeveral whole Hours: Three Hours is the leaſt, but ſometimes it requires four, five, or ſix Hours to make an Outlet to the Matter by Cauſtics, in proportion to the Thickneſs of the Skin and Strength of the Medicine. When the Cauſtic is judged to have remained long enough upon the Abſceſs, the Dreſſing muſt be then taken off, that the noxious Matter may be diſcharged; but if the Cauſtic has not ſufficiently penetrated, the Opening may be forwarded and enlarged by gently applying the Scalpel, Probe, or Spatula, that all the Matter may have a free Paſſage. But as ſoon as the Cauſtic has made an Eſchar or Cruſt, it muſt be mollified by applying *Butyrum recens*, *Ung. Digeſt. vel Baſilic.* to be retained by a Plaſter and Bandage. When the Eſchar is found looſe or ſeparated, the reſt of the Treatment muſt be the ſame with that we mentioned before, in opening the Abſceſs by Inciſion. But to ſay Truth without Diſſimulation, I muſt acknowledge it my Opinion and Advice, that the Knife is greatly preferable to the Cauſtic, as being more neat, expeditious, and ſafe, and the Aperture heals with a ſmaller and neater Cicatrix; ſo that moſt prudent Surgeons do with reaſon always propoſe the Knife before a Cauſtic,

uſing

using the latter only in Cases of great Timidity, and where the first cannot be conveniently admitted.

XI. That our Reader might not be at a loss for the Composition of the *Lapis Causticus*, we thought it would not be amiss here to lay down a short and approved Method of making the same: Take *Ciner. Clavellat. & Calc. vjv. fortiss. ana* ℥vj. *vel Ciner. Clavellator. mj. Calcis vivæ* ℥vj. These being pulverised separately [a], and afterwards mixed together in a large Glass or Earthen Vessel, are to be there dissolved in a good deal of Water, letting them stand an Hour or two to melt perfectly. Then the Liquor, with what it has dissolved, is to be filtrated through a Linen Cloth from its gross Sediment, evaporating it afterwards in an Iron Pan over the Fire. The consistent Mass left after Evaporation is to be put into a Crucible, and melted with a strong Fire, so that it may flow like Oil. It may then be cast into a Mortar or broad Pan, and either cut or beat into small Pieces before it is quite cold: Which are to be put into a Glass very close stopped, and preserved in a dry Place for Use. When an Abscess is to be opened, a sufficient Quantity of this is to be taken and applied, either whole or in Powder, and bound upon the Skin, as we observed before. If the Caustic be wetted, it generally acts a great deal sooner, so as to corrode the subjacent Parts, and make an Eschar in an Hour or two: But when it grows old, by long keeping, it commonly loses its Force, so that at length it cannot corrode at all. Other and no contemptible Methods of preparing this Caustic may be seen in the Chemistry of LEMERY, and the Surgery of DIONIS, *Edit.* 2.

The Caustic how prepared.

CHAP. IV.

Of Tumor and Inflammation in the Breasts.

I. WE have been hitherto treating of Suppuration; our next Business was to have proceeded to a Gangrene; but as there are several kinds of Inflammation and Suppuration which do not commonly terminate in a Gangrene, it was proper first to treat of these separately, before we came to the Consideration of a Gangrene. We begin with those Inflammations which usually afflict the Breasts, being a Disorder most incident to Child-bearing Women, and almost constantly happens in a few Days after their Delivery. If the Milk should be impelled into the Breast too plentifully and forceably, which at such times frequently happens, and if the Mother should then be seized with great Cold, Fear, or Anger, the sanguiferous and lactiferous Vessels being thence obstructed, the Breasts must then become inevitably tumified, and at the same time they will be afflicted with great Heat, Redness, Resistance, and violent Pain. The same Accident sometimes happens to Women that give suck, even a long time after their Lying-in; which proceeds from the same Causes which we just now mentioned; and is also sometimes the Case of those who have no Milk. I have even observed the same Case in a Man, which arose from a great Fright: One Breast was vastly tumified, and turned to an Abscess, from which, upon the first Opening, I extracted above two Pounds of Matter, to the

What happens in an Inflammation of the Breasts.

[a] BOERHAAVE, in his *Materia Medica*, Sect. 412. takes *Ciner. Clavell.* ℥iv. *Calcis vivæ* ℥vj. and uses another Method of Preparation, which did not succeed with me.

great Surprize of the Patient and the By-ſtanders. This kind of Inflammation is uſually attended with a Fever, or great Heat all over the Body, followed with a quick Pulſe, Thirſt, Head-ach, and difficult Reſpiration; and this in ſuch a manner, that a Shivering generally proceeds in its Invaſion.

The Cauſes of an Inflammation in the Breaſts.

II. The general Cauſes of Inflammation in the Breaſts of Child-bearing Women, are uſually, as we hinted before, a ſudden Cold taken when the Body is very hot or in a Sweat, cold Drink, Anger, Fear, Grief, and any other violent Perturbation of the Mind, from whence the Blood and Milk may become inſpiſſated and obſtructed in the ſmall Veſſels of the Breaſt: And though the Inflammation of the Breaſts happens moſt frequently in Women, eſpecially ſuch as have lately lain in, and either will not ſuckle the Infant, or cannot, becauſe it died before or after the Birth, in which Caſe it proceeds from the Stagnation of the Milk brought on by Fear and Grief; yet it may frequently happen from the ſame Cauſes in ſuch as have left off giving ſuck for a conſiderable time, as alſo from a Blow, Contuſion, or ſome other external Injury of the like nature.

The Difference of theſe Inflammations.

III. Theſe Inflammations do not always happen to be equally intenſe and violent; for ſometimes it ſeizes the whole Breaſt, ſometimes only one Side, and greatly tumifies it with violent Pain; but then again, at other times, it occupies only a ſmall part of the Breaſt. Sometimes the Inflammation lies very near the Skin; but then it alſo frequently ſpreads very deep. At one time the Inflammation has very urgent Symptoms, as violent Pain, Heat, Redneſs, and Tenſion; but at other times it ſits very eaſy upon the Part.

Prognoſis.

IV. He that is deſirous to be an able Preſager in the Events of this kind of Inflammation, ſhould firſt carefully conſider the ſeveral Symptoms of the diſordered Part now mentioned. For as the Tumor is leſs, and the Inflammation and Fever ſlighter, the more gentle and happy is like to be the Conſequence, and the leſs is the Danger. For in that Caſe there is room to hope it may be diſperſed, without coming to Suppuration; but on the contrary, the more violent the Symptoms the greater is like to be the Suppuration: Sometimes it turns to a *Scirrhus*, and a *Scirrhus* commonly ends in a Cancer of the Breaſts.

Inflammations of the Breaſts, how to be treated.

V. This Diſorder may be very readily prevented in rich Women, and ſuch as cannot or will not ſuckle their Children, if ſome of the *Emplaſt. de Spermate Ceti*, ſpread on Linen, be applied warm all round upon the Breaſt ſoon after Parturition, being perforated in its Middle to tranſmit the *Papilla* or Nipple; the Acceſſion of the Milk being alſo repelled by a pretty ſtrict Bandage. It may be alſo not improper in this Caſe to hang the *Galactites*, or ſome *Argentum vivum* incloſed in a Nutſhell, about the Patient's Neck, down the Back; and to apply *inter Scapulas*, an *Emp. ex Spermate Ranarum, Saccharo Saturni Oleóque Hyoſciami permixtum.* Among the internal Medicines, the moſt proper are ſuch as bring down the *Lochia Puerperarum*, when they do not flow in ſufficient Plenty of themſelves: The principal for this Purpoſe are *Eſſent. Myrrhæ, Succin. Eſſent. Croc. Elix. proprietat. &c.* taken now and then in a proper Doſe. Laſtly, with reſpect to the proper Diet, it muſt be carefully obſerved to diminiſh the Quantity of Milk by the Smallneſs and Poverty of the Meat and Drink. Upon which account the Patient ſhould be recommended to drink nothing but ſmall Broth, Tea, or the like watry Liquors, for many Days together, till the Afflux of Milk to the Breaſts is found to be ſufficiently weakened. But if the lying-in Mother be deſirous of ſuckling the new-born Infant herſelf,

herself, there can be no better Preservative for her against Inflammations of the Breasts than to keep free from Colds, and to cautiously avoid all violent Affections of the Mind, letting the Child suck frequently at proper Seasons to prevent the Milk from Stagnation. Besides this, Care must be taken to use Plenty of small Broth and thin Fluids for the first Week or two: By which means the Milk will not be so abundant, nor apt to be inspissated in the lactiferous Ducts of the Breasts.

VI. But when Inflammation and Tumor have already fixed themselves in the Breasts, the Surgeon's principal Business is to use all Endeavours to discuss whatever stagnates in the small Ducts and Vessels with the utmost Expedition, both by internal as well as external Medicines; in order to prevent the Tumor from running into Suppuration, or a *Scirrhus:* For when it suppurates, there generally remains an ugly Cicatrix, which is very disagreeable to most Women, but especially the more noble and elegant. As to the internal Medicines proper to be given to Childbed Women, to disperse Tumors in the Breasts which are generally accompanied with a Fever, I would advise the Surgeon and Patient to consult some prudent and skilful Physician on that head; lest the lacteal Fever (as it is generally called) carry off the lying-in Patient under an injudicious Treatment. Cure, (1) by Dispersion.

VII. As to the external Remedies, in which the Surgeon ought to be particularly skilled, the strongest Discutient that I have frequently found to excel others for these Tumors, is the *Emplast. ex Sperm. Ceti præparat.* In the mean time it may be of some Service to lay over the Plaster a discutient Bag, made warm and stuffed *ex Furfure ac Sale, vel Flor. Samb. Chamæmel. Melilot. Lavend. vel ex Sem. Fœnic. Cumin. Anis. &c.* There are some who put Lambs Skin over the Plaster, instead of discutient Bags; which not only defends the Breasts from external Cold, but is also no improper Discutient for what stagnates in them. But there is still a usual and very effectual discutient Application for these Tumors, which is a Calf's Bladder filled with a warm Decoction of *Flor. Samb. & Chamæm.* in Milk, which is to be often applied to the Breast, its Warmth being renewed as it is impaired. Of nearly the same Virtue is the *Emp. Diachyl. simp.* either alone or mixed with *Emp. de Spermate Ceti.* The *Rob. Sambuci* or *Theriaca,* mixed *cum Sale Absinthii,* being spread upon Linen, and applied in the way of Liniment, prove of great Efficacy in dispersing these Tumors, especially if they are applied warm, and covered with warm discutient Bags; but they are hard to be put up with among the rich and very nice Women, because they usually daub the Skin, Cloths, and Bedding. To these we may add the Use of *Acet. Lithargyr. Acet. Cumin. & Aq. Calcis,* which are of very easy and considerable Use; being applied to the Breasts by means of Linen Compresses dipped in the Liquors while hot, and often repeated. A great many esteem it a ready and effectual Remedy to express the Milk upon burning Coals; nor do I think it proper to rashly reject this Method as wholly useless: For though this sort of Cure seems to be sympathetical and superstitious; yet as it may excite a strong Imagination of drying up the Milk in the superstitious Woman, and that Imagination may have a considerable Influence, we see no sufficient Reason to entirely condemn it. But if the Breasts are internally very much distended with Milk, it will be proper to discharge it by the Sucking either of an Infant, an old Woman, or a Puppy, or else by the Application of a Glass External Resolvents.

Instrument

Instrument which we shall hereafter describe: The Milk should be thus discharged till the Tumor subsides and the Pain vanishes.

(2.) by Suppuration.

VIII. But when the Inflammation is greater than can be dispersed in the Space of four or five Days; or when, as it frequently happens, the Surgeon is consulted too late; the best way is to forward it to Suppuration as fast as possible, rather than hazard its turning to a *Scirrhus* or Cancer by Delay. If therefore the noxious Matter be not arrived at a State of Maturity by the Use of the discutient Medicines, in order to accelerate the Suppuration there ought to be a speedy Application of an *Emp. Diachyl. cum Gumm.* or *Emp. de Hyosciamo.* But more effectual Cataplasms are to be also made use of to digest the Matter, some of which we mentioned in the preceding Chapter, §. 5, *and* 6. and others we shall also propose here. As,

1. ℞ *Farinæ Siligin.* ℥ ß *vel* ℥ j. *Mellisque quantum ad Cataplasma conficiendum sufficit. Tum Lactis & Croci pauxillum admisceatur, calefactúmque in patellâ quadam linamentis obducatur, mammisque superimponatur, ac sæpius postea renovetur. Vel,*

2. ℞ *Farinæ Siligin.* ℥ iv. *Gummi Galbani vitello ovi resoluti* ℥ j. *Aceti* ℥ iij. *his aquæ tanta portio admisceatur, quanta Cataplasmati coquendo sufficit. Vel,*

3. ℞ *Fermenti Panis* ℥ ij. *Mellis* ℥ ß. *Saponis Venet. comminuti, & Olei Chamæm. ana* ℥ ij. *quæ sibi invicem commixta in patellam conjiciantur, atque igni admota in pulticulam sive malagma convertantur.*

How the Abscess is to be opened.

IX. These Cataplasms are to be applied hot and very often to the Breasts, keeping them on by Linen Compresses or Bolsters, the better to retain the Heat, till the Tumor breaks of itself, which it often does in this Part from the Thinness of the Skin, or else it may be conveniently opened by the Scalpel. But the Incision ought always to be made in the lower Part of the Breast, unless Necessity obliges it to be otherwise, lest there should be left a visible Cicatrix after the Cure. Though there are not wanting some Surgeons who use the Caustic for opening Suppurations of the Breasts; yet, as they usually occasion indecent *Cicatrices*, we think the Knife is greatly preferable to such Medicines.

Treatment after the Discharge of the Matter.

X. After the noxious Matter has been discharged from the Breasts, the rest of the Treatment is to be the same with what we proposed in the Cure of other Wounds and Abscesses. The Ulcer is to be first cleansed with some digestive Ointment, and afterwards healed with some Balsam, as the *Peruvian*, for Example, with Oil of Eggs and Wax. But when the Suppuration has run very deep, the best way is to inject the Wound with a cleansing *Decoct. Saniculæ vel Alchimillæ* mixed with a little *Mel Rosarum*; and to prevent the Opening from closing before the Bottom is filled up with new Flesh, it will be proper to introduce a soft Tent or some scraped Lint. As the new Flesh grows up from the Bottom, the Tent may be gradually lessened or made shorter, and, at last, wholly removed when there is little or no Occasion for it.

What is to be done when the Tumor can be neither dispersed nor suppurated.

XI. But it sometimes happens that Tumors in the Breasts of Child-bed and suckling Women will neither yield to Dispersion nor Suppuration, but will retain their ill Condition for the Space of several Months or Years. If this happens in young and healthy People, it occasions little or no Disturbance to the Œconomy, nor is there great danger of the Tumor's turning to a *Scirrhus* or Cancer,

Cancer, which is what the poor female Patient is often vaſtly afraid of. The Surgeon's Buſineſs here is to take care to keep the afflicted Patient in good Heart by his Perſuaſions; and to the Tumor itſelf is to be applied *Emp. de Spermate Ceti*, to be conſtantly retained on, keeping the Part always carefully defended from the external Cold; by which means Tumors of long ſtanding have grown gradually leſs, and at laſt vaniſhed. But the Caſe is uſually otherwiſe in Women who are advanced in Years, and of a melancholy or ſorrowful Diſpoſition; for in ſuch there is great Danger of the inveterate Tumor turning to a *Scirrhus* or Cancer.

CHAP. V.

Of Inflammation in the Teſticles.

I. SOMETIMES an Inflammation and Tumor happens in one or both of the Teſticles; which, if it be any thing violent, generally tortures the miſerable Patient with moſt ſharp Pains. Inflammation does ſometimes happen in the Teſticles.

II. This Diſorder may ariſe from two Cauſes; either from ſome great *external Violence*, as by a Fall, Blow, or Contuſion; to which ſome are liable from mounting a Horſe with too much Haſte and little Thought; or from a *Venereal* Cauſe; chiefly when ſome of the Venereal *Virus* inſpiſſates the *Semen*, and obſtructs its Courſe through the ſmall *Tubuli* of this Gland. The Cauſes of Inflammation in the Teſticles.

III. An Inflammation of the Teſticle is diſtinguiſhable from any other Diſorder in theſe Parts, and particularly from a *Hernia Scroti*, when the Patient has previouſly ſuffered any of the Cauſes §. 2. and complains of a great Swelling, Heat, Redneſs and Pain in his Teſticle, the ſame being confirmed to the Surgeon by Inſpection; his Feeling will alſo afford him ſome Knowledge into the Nature and Kind of the Diſorder; for upon applying the Hand, one or both of the Teſticles are found to be ſwelled conſiderably larger than they ought to be, enlarging ſometimes more than equal to the Size of one's Fiſt. *Diagnoſis.*

IV. This Diſorder is not of ſo ſlight a Conſequence as is generally thought; for it very frequently turns out ſo as to deprive the Man either of his Life or Virility, by degenerating into an Abſceſs or *Sphacelus*; or elſe it turns to a *Scirrhus* or Cancer, which have alſo Death for their uſual Conſequence; or laſtly, it is followed by a *Sarcocele* or *Hydrocele*, which are little leſs troubleſome and fatiguing to the Patient. *Prognoſis.*

V. The ſame external Medicines will ſerve to reſolve the Inſpiſſations which happen in an Inflammation of the Teſticle, which we before oppoſed to Inflammations in the Breaſts: And above others we prefer *Acet. Lithargyriſat. Aq. Calcis cum Sp. Vin. Camph. ceruſſâ, tutiâ, Lap. Calamin. permixt.* but in the Night-time, when the Application of Fomentations is not ſo convenient, it will be proper to apply *Emp. de Ranis cum duplici Mercurio, vel Emp. Diachylon.* Nor are internal Medicines to be here neglected; for if the Tumor aroſe from ſome external Violence, or an Inſpiſſation of the Blood, he ſhould often take of the *Pulv. ex Lap. Cancror. præp. Teſt. Oſtreor. Mat. Perlar. Cinnab. Arcan. duplicat. &c.* together with thin Drinks, as Tea, Decoctions of the Roots, Woods, and diſcutient Herbs; plentiful Feeding, Things which heat Cure by Diſperſion.

the

the Blood, and Aliment of difficult Digeſtion are to be carefully avoided. And if the Inflammation ſhould be of the more violent kind, it will not be amiſs to mix a little Nitre with the forementioned Powder, and to drop ſome *Sp. Vitriol. Sulphur. &c.* into his Drinks, not neglecting to open a Vein in plethoric Habits.

Treatment when from a Venereal Cauſe.

VI. If the Diſorder take its Riſe from ſome Venereal Taint, it ſeems neceſſary to adminiſter good brisk Cathartics, always adding a Quantity of *Merc. Dulc.* to them; at the ſame time ſuch other Medicines ſhould be uſed as are calculated particularly againſt the Venereal Diſeaſe itſelf. Warm Drinks made of Tea, or a Ptiſan of Barley, Liquorice and Aniſe, boiled in Water, muſt not be here neglected. By taking theſe, the Blood uſually becomes temperate and attenuated, and the Tumor frequently diſperſed.

How a Suppuration is to be managed.

VII. Laſtly, If the Surgeon be called in too late, or if the Inflammation prove ſo violent as not to give way to the preceding Remedies for Diſperſion, a Suppuration or Gangrene is generally the Conſequence. Therefore the Application of the ſame maturating Remedies will be here proper, which we propoſed in the preceding Chapter for an Inflammation of the Breaſts. And when the Matter is ſufficiently digeſted, and the Abſceſs does not break ſhortly of itſelf, it will be proper to open it carefully by Inciſion; the Matter being diſcharged, the Wound is to be firſt well cleanſed by ſome digeſtive Ointment, and by injecting ſome ſtrong ſpirituous Fomentation which reſiſts Putrifaction, then healing it up by means of ſome vulnerary Balſam. But to firſt digeſt the Matter, and mitigate the Pains, it is found extremely ſerviceable to apply *Emp. de Hyoſciamo, vel Diachyl. cum Gummis*; which are alſo ſtrongly recommended by LUDOVICUS in his Chirurgical Works, pag. 718. While theſe Applications are properly uſed, we muſt ſtrive to wholly extirpate the Venereal Diſeaſe itſelf: And notwithſtanding in many of theſe Caſes the *Scrotum* happens to be conſumed, ſo as to leave the Teſticle quite bare; yet the Loſs of Subſtance in the *Scrotum* may be generally reſtored again, by a proper Treatment with digeſtive and balſamic Remedies, as I myſelf have frequently ſeen.

CHAP. VI.

Of an ERYSIPELAS.

An *Eryſipelas*, what it is.

I. AN *Eryſipelas* is an Inflammation ſeated in the exterior Part of the Skin and *Membrana Adipoſa* beneath it, which wanders and ſpreads ſometimes to a very great Extent, being accompanied with great Redneſs, Heat, and often Pain. Upon preſſing the Part afflicted with the Finger, it looks white; but upon removing the Finger it turns red again. This Inflammation has been obſerved to fix itſelf oftenest upon the Arms or Legs; but ſometimes it ſeizes the Head, Neck, Shoulders, and Face[a]; often the Noſe, and ſome other Parts. It generally ſeizes the Patient with a *Horror* or Shivering, after which a great Heat ariſes, equal to what is uſually felt in burning

[a] An Example of an enormous *Eryſipelas* in the Face and Eyelids, which laſted two Months, may be ſeen deſcribed by VERDUC on Bandages, Chap. III. and another exulcerated *Eryſipelas* in both the Thighs is obſerved by SCULTETUS, *Obſ.* 92.

Fevers;

Fevers; and hence it has been diſtinguiſhed, as well by the Ancients [b] as Moderns, by the Name of *Ignis Sacer*, or *St. Anthony's Fire*.

II. Any Cauſe that can produce other Inflammations may alſo occaſion an *Eryſipelas*; more eſpecially expoſing the Body to ſudden Cold when it is in a great Heat or Sweat, an obſtructed Perſpiration, the drinking too much fermented and ſpirituous Liquors, a Surfeit, or over feeding; and laſtly, a hot and ſharp State of the Blood: From all which, either aſunder or together, the Blood may be eaſily inſpiſſated, the ſmall Veſſels contracted, and Obſtruction, with its conſequent Inflammation be brought on. Cauſes of an *Eryſipelas*.

III. With regard to the Event of this Diſorder, it is obſerved that there is no great Danger when the Inflammation is but ſmall and properly treated. On the contrary, when the Inflammation is violent, the Habit of the Body ill and infirm, the Diet and way of Life irregular, or the Part affected expoſed to Cold, neglected or improperly treated; it is no wonder if the Inflammation turns to an ardent Fever, an ill conditioned Exulceration, Gangrene, or *Sphacelus*. But an *Eryſipelas* is more particularly dangerous when treated with external Applications which are cooling, fat, or oily; and when internal Medicines are taken which heat the Blood, whether Wine, Cordials, Spices, or the like. *Prognoſis.*

IV. In order to cure an *Eryſipelas*, the grand Intention is to dilute the inſpiſſated Blood, and divide it where it ſtagnates and obſtructs. To effect which, there ſeems to be no better way than that of giving Plenty of thin watry and warm Drinks, by which a gentle and laſting Sweat may be excited: For by this means all Viſcidities in the Blood will be diluted, any Acrimony will be temperated, and what heſitates or obſtructs will be reſolved; and laſtly, the uſeleſs and corrupted Part of the Blood will be ejected by the inviſible Pores of the Skin, by which natural Tranſpiration the *Eryſipelas* will be happily carried off as by an inſtant Remedy. Heating Medicines of all kinds, eſpecially the *Tinct. Bezoartica*, *Aq. Epidem.* and other ſuch ſtrong, heating, and ſpirituous Medicines are, in my Opinion, wholly foreign and improper for this Cure; becauſe the Inflammation is generally more increaſed than abated by the uſe of them. On the contrary, Medicines which are temperating and moderately cooling, are here much more ſafe and uſeful; particularly Preparations from Elder, as *Rob. Sambuc.* ℥j. *vel Cochlear* j. diluted *in Aq. Flor. Samb.* In the mean time may be uſed Tea, Coffee, or a Diet Drink of Phyſical Herbs. The Patient's Body is to be carefully defended from the external Cold, and to be kept in a gentle and conſtant Sweat. When the Patient is troubled with great Thirſt, he may drink thin Barley Gruel, and for Variety, a little warm ſmall Beer; for the main of the Cure generally depends upon the Warmth and ſmall Drinks. But if the *Rob. Sambuci* ſhould not be liked by the Patient, ſome Diaphoretic Powder may be given in its room, or together with it, made of the *Teſtacea*, *Antimon. Diaphoret. cum Nitri portiunculâ*, in order to excite a gentle Sweat; but then the warm thin Drinks ſhould not be neglected in the mean time. Laſtly, the Regulation of the Nonnaturals proper here, we ſuppoſe to be ſufficiently evident from what we have already ſaid on that Head, under Inflammations in general. Internal Treatment.

[b] *Vid.* CELSUS *variis in locis.*

External Treatment.

V. If the Inflammation in an *Eryſipelas* ſhould be but ſlight, it may then be often cured only by external Warmth; but when violent, external Warmth will not be of itſelf ſufficient, without the Application of Medicines. The diſordered Part is therefore to be covered with *Rob. Sambuci* ſpread on blue Paper or Linen, over which are to be laid warm Cloths, or diſcutient Bags, as we propoſed before in Inflammations. But the uſe of the *Rob.* as well as the *Theriaca cum Sale Abſinthii* is ſeldom complied with, becauſe of their uncleanlineſs, though very effectual in mitigating Inflammations, as we obſerved under Inflammations of the Breaſt; upon which account, the uſe of diſcutient Powders is much more frequent; among which, the following ſeems to have the Preference, compoſed *ex Flor. Samb. Glycyrrhizâ contritâ, cretâ præparatâ, Ceruſſâ item ac Myrrhâ, æquis portionibus admixtis cum admixto pauxillo Camphoræ*; this is to be applied to the Part between ſoft blue Papers or Linen Cloths, over which are to be put little warm Bags. To this we may add the *Pulv. contra Eryſipelas Mynſichti*, which is very efficacious, though not much uſed amongſt the Apothecaries. Laſtly, we need not ſay much here of the green internal or middle Bark of Elder, whoſe eminent diſcutient Virtue in Inflammations is almoſt known by every body, and has been this long time confirmed by conſtant Experience.

A Caution concerning an *Eryſipelas*.

VI. Notwithſtanding there are ſome who judge liquid Medicines wholly improper for the Cure of an *Eryſipelas*; it muſt yet be allowed that *Sp. Vin. Camph.* uſed warm, either alone or mixed *cum Croco vel Theriacâ* applied warm with coarſe Paper or Linen Rags, are of very great Service here: I alſo cannot paſs by a Mixture which I have frequently experienced in this Caſe, *ex Aq. Cale. viv. cum Sp. Vin. Camph.* SCULTETUS (*Obſ.* 94.) greatly extols the following liquid Remedy againſt an œdematous *Eryſipelas*; he aſſerts that he never found any thing anſwer like it:

℞ *Lixiv. mediocr. ex cinerib. vitis* ℔j. *Nitri* ʒj. ß. *Salis commun.* ʒj. *Aceti vini opt.* ʒj. *M.*

Univerſals being premiſed, this Mixture may be applied to the Part affected by means of double Compreſſes warmed and retained on with Bandage, by which means it has ſurprizingly diſperſed, in three or four Days time, ſuch large Tumors of this kind, as have threatened a Gangrene. In the mean time, other liquid Medicines which are over acid, and almoſt all Obſtruents and Aſtringents, together with fat and oily things, ſhould be cautiouſly avoided: For it can ſcarce be imagined how vaſtly theſe ſtop up the Pores, and by hindering the Blood from throwing off its Feculencies by Tranſpiration, fling the Patient into imminent Danger.

Bleeding and Purging when to be uſed.

VII. Bleeding and Purging ſeem not to be ſo neceſſary in an *Eryſipelas* as in a *Phlegmon*: For whatever is corrupted of the Juices in an *Eryſipelas*, as it lies near the Skin, ſeems to be much more eaſily diſchargeable by Sweat. But when the Heat is too great, the Puſſe too high, and the Blood too abundant, Bleeding in that Caſe cannot but be judged proper. But to keep the Bowels open, Glyſters ſeem preferable to ſtrong Purges.

An *Eryſipelas* ſometimes comes to Suppuration.

VIII. It here frequently happens that an *Eryſipelas* comes to Suppuration, from whence uſually ariſe the very worſt of untractable and ſpreading Ulcers. When this is the Caſe, the Ulcer is always to be carefully cleanſed, and dreſſed with

with *Ung. Saturnin. vel de Lithargyro, vel de Ceruſſâ, unà cum Emplaſtro Saturnino*, to temperate the Acrimony of the *Serum*. But it is alſo at the ſame time proper to take ſuch internal Medicines as will temperate and ſweeten the Blood, uſing ſometimes ſuch as diſcharge ſharp Humours by Stool; and laſtly, a ſtrict Regimen of Diet muſt be kept up to, till the Ulcers are healed again, which is even then a very difficult matter to effect, eſpecially when ſeated in the Legs of old cachectical or valetudinary People. See SCULTETUS on this Head, *Obſ.* 90.

CHAP. VII.

Of a FURUNCLE, *or* BOIL.

I. A BOIL or Furuncle is a ſmall reſiſting Tumor, with Inflammation, Redneſs, and great Pain, ariſing in the *Membrana adipoſa*, under the Skin. As there is no Part of the Body free from being the Subject hereof, ſo the whole is ſometimes ſo miſerably infeſted with them, that the Patient can hardly tell how to ſtir himſelf, or on what part to lie. Not only Adults, but alſo the younger, even new born Infants are obnoxious to this dreadful Diſorder, which occaſions in them moſt fatiguing Clamour and Reſtleſſneſs. A Boil, what.

II. The *Signs* proper to a Furuncle we ſuppoſe to have been ſufficiently evident in what we but now propoſed concerning its Nature. And although it be apparent from what has been ſaid that there is no great Danger in this Diſeaſe when it happens to Adults; yet it ſometimes happens when they are very numerous in tender Infants, that they excite not only violent Pains, Reſtleſſneſs, and Toſſings, with Weakneſs, Convulſions, and Epilepſies, but at length even Death itſelf follows. Signs and Cauſes.

The principal *Cauſe* of Furuncles and their Symptoms is the ſame as in other Inflammations, *viz.* a too glutinous and inſpiſſated State of the Blood; therefore the greater the Inſpiſſation, the worſe and more numerous will be the Furuncles.

III. With regard to the Cure, it ſeems to conſiſt chiefly in reſtoring the inſpiſſated and ſtagnating Blood to its former Circulation and free Motion, and that as ſoon as poſſible, by proper Remedies. As the Diſorder ſeldom happens, it is more ſeldom that it happens to be treated with internal Medicines, the means generally uſed being only external Remedies. But when they are very numerous, or return again, it is neceſſary to uſe internal purging Medicines, and ſuch as attenuate and cleanſe the Blood. So that in adult Patients it ſeems proper to bleed both by the Lancet and Scarification with Cupping; at the ſame time a ſtrict Regimen of Diet ſhould be uſed, drinking frequently and plentifully of a Decoction of the Woods, and ſuch like Attenuaters of the Blood; the Patient ſhould alſo entirely abſtain from drinking fermented and ſpirituous Liquors, particularly Wine and its Spirit, and from the too frequent uſe of Tobacco. Cure.

IV. When the Diſorder is recent, external Medicines only will frequently ſuffice for the whole Cure. For this Purpoſe the following Mixture is of great ſervice, External diſcutient Remedies.

made of Honey acidulated with Spirit of Vitriol, till the Mixture has acquired a conſiderable Sharpneſs, which is then to anoint the Furuncles. Of no leſs Virtue is the frequent touching them with mere *Spirit. Vitriol. aut Sulphuris.* And laſtly, diſcutient Plaſters are often found very ſerviceable here, as *Emp. Diachylon ſimplex, de Meliloto, de Spermate Ceti, vel Diaſaponis.*

How they are to be brought to Suppuration.

V. But if the Remedies hitherto propoſed prove inſufficient to diſperſe the Tumor, either through ſome Neglect or any other Cauſe; the only means then left, is to bring it to Suppuration. And indeed the Maturation of the peccant Matter is found a very difficult taſk in ſome Caſes, inſomuch that the Tumor ſometimes remains wonderfully hard and troubleſome, even after ſeveral Weeks Treatment. Sometimes the ſtagnating Matter becomes ſo acrimonious, from its great Inſpiſſation and long Stay, that the Inflammation degenerates into Ulcers, which grow gradually worſe and worſe, till they end in incurable *Fiſtulæ*. In the mean time, to promote and quicken the Suppuration, it is generally found of great ſervice to apply *Emplaſtrum ex Melle & Farinâ confectum, necnon Empl. Diachylon cum Gummis*; and where theſe are inſufficient, to make uſe of the maturating Cataplaſms which we before recommended in a *Phlegmon*, *Book* IV. *Ch.* II. §. 16. and in Inflammations of the Breaſts, *Book* IV. *Ch.* IV. §. 8. Though we muſt obſerve here, that Plaſters are much more commodious for uſe in Infants, than Cataplaſms. Laſtly, when the Furuncle is ſufficiently maturated, which we may learn from its Softneſs and yellow Head, we muſt have recourſe directly to the Scalpel, and having made an Opening, we muſt diſcharge whatever corrupted Matter is therein contained. After this is to be applied *Emplaſt. Diachyl.* and the Ulcer is to be daily cleanſed from its Matter, till being freed from all Malignity, it becomes afterwards healed up.

Furuncles in Infants how to be treated

VI. When ſucking Infants are afflicted with Furuncles, it is proper to give the Mother or Nurſe ſome purging Medicine, and to order a ſtrict Regimen and Diet; at the ſame time the Infant ſhould take ſome gentle laxative Medicine, with abſorbent Powders *ex Lap. Cancror. conch. Mat. Perlar. Pulv. Aniſi et Antimon. &c.* to allay the Acrimony of its Juices. Laſtly, thoſe Puſtules and Pimples which ariſe in the Skin of the Face of ſome People are no leſs than ſmall Furuncles, and therefore ought to be treated like them. The drinking of Whey and the Mineral Waters is extremely uſeful for People who are troubled with theſe.

CHAP. VIII.

Of the BUBO *and* PAROTIS.

The *Bubo* and *Parotis* what they are.

I. THERE are ſome kinds of Tumors which ariſe with Inflammation, only in certain or particular Parts, to which they are proper, as in the Arm-pits, in the Groins, and under the Ears; and theſe are, from the Parts which they affect, called *Parotids* when under the Ears, but *Bubos* the reſt.

The Kinds of theſe Tumors.

II. The Diviſion or Diſtinction of theſe Tumors, the *Parotis* and *Bubo*, is generally twofold; into ſuch as are *benign*, or ſuch as are *malignant*: Which Diſtinction, as it regards the different Method of Cure, we ſhall explain a little more

more at large. They are ſaid to be *benign*, (1.) When they ariſe ſpontaneouſly, without any preceding contagious and peſtilential Diſeaſe, as they frequently do in Infants; (2.) Thoſe are alſo of this kind which come after benign Fevers, being a critical Diſcharge of the Diſeaſe: But the *malignant* are ſuch as happen in the Peſtilence or Venereal Diſeaſe, and are therefore commonly termed *Peſtilential* or *Venereal Bubos*.

III. With regard to the *Cauſes* of benign *Bubos*, we muſt obſerve that they ariſe from the ſame internal Cauſes with all the reſt of the Inflammations; that is, from an Inſpiſſation and Obſtruction of the Blood; ſo that they differ from other Inflammations only in the particular Part where they are ſeated, as in the Groins, under the Arms and Ears, where there are many ſmall Glands and much Fat. Cauſes of benign *Bubos*.

IV. Nor is the *Diagnoſis* of theſe Tumors difficult, if we do but conſider whether there has preceded any Peſtilential or Venereal Cauſe, to occaſion that Tumor and Inflammation in thoſe Parts. *Diagnoſis*.

V. When theſe Tumors are benign, their Conſequences are uſually milder and leſs dangerous; becauſe they may be generally either diſperſed or ſuppurated. But a ſpeedy Diſperſion or Suppuration of theſe Tumors is found to be more difficult and of pernicious Conſequences in Patients of an ill Habit; inſomuch that a Suppuration of them ſometimes produces *Fiſtulæ*, which are very difficult to cure. Laſtly, the *Parotids* are the moſt difficult to cure, the Inguinal *Bubos* not ſo difficult; and the Axillary *Bubos* are the eaſieſt of all, as they generally tend to Suppuration. *Prognoſis*.

VI. In *Bubos* which are unaccompanied with any other Diſeaſe, the frequent taking of ſome cathartic Medicine with an Addition of *Merc. Dulc.* is found to be of great Service; as it draws off the glutinous and inſpiſſated Blood from the Part affected, and at the ſame time thins the whole. Other Medicines which attenuate the Blood ſhould be alſo uſed, ſuch as we before propoſed for Furuncles. But if there ſhould be any thing of a Fever, the Advice of ſome prudent Phyſician ought to be called in, who will take Care of the Fever, and treat it with proper Medicines. Internal Treatment.

VII. When the Inflammation is ſo gentle as to give hopes of Diſperſion, it may be proper to apply diſcutient Plaſters externally; as *Emp. Diachyl. ſimplex, de Spermate Ceti, de Galbano, Diaſaponis, vel de Ranis cum Mercurio, &c.* ſince by theſe means both *Parotids* and *Bubos* have been frequently diſperſed. External Reſolution or Diſperſion.

VIII. But when the Inflammation proves more violent, the Pains more intenſe, and the diſcutient Plaſters avail nothing, we muſt then ſtrive to bring it to Suppuration, by the Application of *Empl. Diachylon cum Gummis*, or ſomething as effectual here. If violent Pains alſo afflict the Patient, the frequent Application of digeſting Cataplaſms warm to the Part, will generally not only mitigate the Pain, but alſo greatly promote a Diſperſion, or elſe a Digeſtion and Maturation. Cataplaſms of this kind may be made of the Crumb of Bread and Milk, boiled to a proper Conſiſtence, mixing afterwards a little Saffron therewith; or elſe Meal with Honey and freſh Butter, reduced to the Conſiſtence of a Cataplaſm over the Fire, may be frequently applied warm, and a little Quantity of *Theriaca* may be added to it with Advantage. Suppuration how promuted.

IX. Cataplaſms like the former, or ſuch as we recommended in a *Phlegmon*, and Inflammation of the Breaſts, ſhould be thus frequently applied warm to the Tumor, The Treatment after Suppuration.

Tumor, till the ſtagnating Matter appears to be ſuppurated. As ſoon as we find this, we muſt directly make an Opening, either with the Scalpel or Cauſtic. See before *Chap.* III. §. 10. But great Care muſt be taken in the Opening, not to wound any of the large Veins and Arteries which are near the Abſceſs, as the Jugulars and Carotids in the Neck, the Axillaries under the Arm, and the Crurals in the Groin; for a fatal Hæmorrhage might by that means be brought on. As ſoon as the Abſceſs is opened, the remainder of the Treatment is to be the ſame with what we have ſo frequently adviſed in other Abſceſſes. More eſpecially it is of Service here to apply *Empl. Diachyl.* as it readily diſperſes or ſoftens any remaining Hardneſs that may adhere to the Mouth of the Ulcer.

CHAP. IX.

Of Peſtilential Bubos, *where alſo of* Carbuncles.

The Kinds of peſtilential Tumors.

I. PESTILENTIAL Tumors are uſually diſtinguiſhed by Phyſicians into *Bubos* and *Carbuncles*. And here, by the Name of *Bubo* they comprehend all Tumors, not only ſuch as ariſe under the Ears, Arms, and in the Groins, but alſo in the Neck, Breaſt, Arms, Legs, and other fleſhy Parts of the Body, which ſwell and inflame in Peſtilential Fevers; whilſt Nature endeavours to drive out the peſtiferous Matter, which lay concealed in the Body.

Diagnoſis. II. Peſtilential *Bubos* are diſtinguiſhable from other Tumors, by their happening at a time and in Conjunction with the Plague, and from their being accompanied in the Patient with the Symptoms proper to that Diſtemper. For it muſt be here obſerved, agreeable to the Teſtimonies of the beſt modern Writers, who have lived in the Time of the Plague [a], that People who are ſeized and infected by the Diſtemper, if they do not die quickly, are ſhortly to expect theſe Tumors in ſeveral Parts of their Bodies. They appear ſometimes ſooner, at other times later; in ſome the Tumors appear before they are taken ſick by, or ever perceive the peſtilential Venom; in others, the Tumors are two, three, and four Days, after the Appearance of the Diſtemper, before they come out; but they are ſeldom obſerved to come out later. Theſe Tumors or *Bubos* are ſometimes joined with Carbuncles: But though the *Bubos* frequently ariſe without the Carbuncles, yet the Carbuncles ſeldom ariſe without Tumors.

Prognoſis. III. It has been this long time obſerved, particularly in the later Plagues, that ſuch Patients as had Tumors come out without any very bad Symptoms, had them maturate ſpeedily, and were the ſooneſt free from the Diſtemper: So that it is not without Reaſon affirmed, by ſome of the more learned and modern Phyſicians, that *almoſt the whole Buſineſs of curing the Plague* conſiſted in carefully promoting the Eruption of *Bubos* and Tumors, nor that any one could be

[a] As by GOD's Providence I never ſaw the Plague, I cannot write any thing of it on my own Experience; yet I was unwilling to be ſilent on ſo conſiderable a Diſorder, and not mention what has been obſerved and confirmed by the beſt modern Phyſicians: I therefore carefully peruſed ſuch as had obſerved the laſt of this Diſtemper in *Auſtria*, *Bavaria*, *Sileſia*, *Pruſſia*, *Poland*, *Holſatia*, *Denmark*, and *Marſeils*, endeavouring to reduce what they had obſerved with regard to the Symptoms, &c. to a ſort of *Compendium*, that my Reader might rely on them afterwards.

preſerved

preſerved but by means of thoſe Tumors; while thoſe who rightly cure theſe *Bubos*, do alſo at the ſame time rightly cure the Peſtilence. Their Caſe being thus, reſolving, diſcutient, and repelling Medicines, together with Bleeding and Purging, are ſo far from proper in the Cure of the Plague, that by throwing the Venom again into the Blood, they deſtroy the poor Patient. Therefore the chief Buſineſs of the Phyſician or Surgeon here, is carefully to aſſiſt Nature in her Endeavours to throw out the Tumors as ſoon as poſſible, and to bring them ſpeedily to Suppuration and Maturity.

General Treatmen.

IV. That this may be effected the more readily, it ſeems to be much the beſt way to order the Patient to keep houſe upon the firſt Appearance of the Tumors, or rather to keep in a warm Bed, to be more ſecure from the Air. For by this means the Patient reſts more ſecurely from the external contagious Air, and by the uſe of proper external and internal Medicines, the *Bubos* may be more regularly expelled and brought to Suppuration.

External Treatment.

V. Externally it is very ſerviceable to rub the tumified Part pretty ſtrongly with the Hands or Cloths, and, what is ſtill preferable, to apply external maturative and emollient Medicines, whereby they will come out the ſooner. And we ſhall alſo here find great Benefit from the uſe of a Cataplaſm made *ex Fermento Panis calido, vel ſolo, vel et cum Sale atque Sinapi contrito.* By means of this the tenſe Parts are relaxed and ſtimulated, whereby the peſtilential Matter may be received and caſt off from the Blood, and come afterwards to Suppuration. Of the like Virtue are not only the Cataplaſms which we before recommended for ſuppurating other Tumors, in *Chap.* II. §. 16. and *Ch.* IV. §. 8. but more particularly thoſe which are made *ex Cepis ſub cineribus toſtis, atque cum Theriacâ et Butyro ſubactis, vel etiam ex Pane Triticeo ſive Similagineo interiori, cum Lacte atque Croco probè concocto.* But there are ſome Surgeons who prefer emollient Plaſters to Cataplaſms, becauſe the frequent renewal of the Cataplaſms requires the Body to be often uncovered, whereby the Perſpiration is impeded and diſturbed. The emollient Plaſters uſed inſtead of the Cataplaſms are the *Empl. Diachylon ſimplex vel compoſitum*, or ſuch as follow. The excellent BARBET in his Treatiſe *de Peſte* particularly recommends the following Plaſter, which ſeems to be very conſiderable:

℞ *Empl. Diachyl. c. Gummis, de Mucilaginibus ana* ℔ ß. *Seminis Sinapi pulveriſati* ℥iij. *Unguenti Baſilici* ℥iv. *M. f. Empl.*

A Plaſter of this is to be applied to the tumified Part, after it has been firſt well rubbed, and to be renewed every or every other Day. The celebrated Dr. HODGES in his Deſcription of the great Plague in *London An.* 1665. greatly recommends the following:

℞ *Empl. Oxycroc.* ℥iij. *Gum. Galban. colat. Carannæ ana* ℥j. *Picis Naval.* ℥ij. *cum Ol. Chamæmel. liquato, f. Empl.*

This may be uſed like the former. Nor is the uſe of that Plaſter to be deſpiſed here, which is made of Honey, Meal, and the Yolks of Eggs. But the bliſtering with *Cantharides* and dry Cupping, uſed by the Ancients to forward Suppuration, are wholly rejected by the moſt expert of the modern Phyſicians in the Cure of the Plague.

VI. But

A particular Obſervation of BEINTEM's.

VI. But what the celebrated *German* Phyſician BEINTEM obſerves, is not a little ſurprizing and worthy of our Conſideration; he aſſerts in the laſt Book of his *Latin* Treatiſe on the Plague, that Peſtilential *Bubos* were frequently diſperſed and cured without any Danger, merely by the Application of warm Aſhes. Though there is ſcarce any body beſides him, that adviſes to diſcuſs or cure Peſtilential *Bubos* without bringing them to Suppuration, or that ever found ſuch a Method ſafe and ſucceſsful; but in the Judgment of BEINTEM, the Peſtilential Venom was not drove into the Blood again in the Diſcuſſion, but was rather attracted and carried off by the Aſhes.

Internal Method of Cure.

VII. To theſe external Applications it will be proper to join internal Medicines, by the help of which, the Venom lurking in the Body may be expelled in a gentle Sweat. But ſuch ſudorific Medicines as are very ſtrong and heating have been always found dangerous and pernicious by the modern Phyſicians. Warm and watry Drinks have been generally found more ſafe and uſeful in this Caſe, as being particularly adapted to temperate the Blood and excite a gentle Sweat. Among theſe Drinks we may reckon common Tea, with the addition of a little Saffron, or Infuſions of other alexipharmic Herbs, as *Salv. Scordium, Ruta, Millefol. Betonica, &c.* or elſe the plentiful drinking of ſome warm Ptiſan, made with or without *Rad. Scorzoner.* taken till it excite a conſtant but very gentle Sweat: And as the more vehement ſort of Sudorifics are improper, ſo the drinking of cold Liquors is generally found equally pernicious; for they not only wonderfully ſuppreſs the gentle Sweat, but alſo ſtrike in the *Bubos*, in whoſe Eruption a happy Cure chiefly conſiſts. The Air of the Patient's Chamber ſhould be temperate, neither too hot nor too cold; his Bed ſhould alſo be the ſame, and made as convenient as poſſible. If the Patient ſhould find himſelf very weak, but without any great Heat, it will not be improper to give a few Drops of *Elix. Proprietatis vel Mixtur. ſimplicis, Tinctur. Bezoart. Eſſent. Myrrhæ, Eſſent. Scordii, etc.* about thirty or forty Drops for a Doſe, two or three times a Day, in ſome warm Liquor; or it may be requiſite to give ſome proper bezoartic Powder. On the other hand, in warm Conſtitutions, where the Heat is too violent, it will be proper to give *Nitrum depuratum cum Lapidibus Cancrorum Conchiſque præparatis*; alſo temperate Acids, as *Succ. Malor. Citreor. Ribeſior. Granator. etc. vel Syr. ejuſd. cum Aq. Borag. Bugloſſ.* or any thing that is temperately cooling, to which the Patient has a Fancy; and if the Heat be ſtill more vehement, it may be neceſſary to drop in *Spiritûs Vitrioli dulcis aliquot guttulas.*

How the Abſceſs is to be opened.

VIII. The Medicines hitherto propoſed are all of them allowed to be the moſt proper to be often taken, and ſufficiently powerful to drive out any peſtilential Venom that may lurk in the Blood, agreeable to the Writing and Practice of the moſt expert Phyſicians who have lately wrote in *Poland, Pruſſia, Denmark, Auſtria, Hungary, Ratiſbon, etc.* The uſe of theſe ſhould therefore be continued till the Tumors are either diſperſed (which they allow to ſometimes happen) or ſuppurated and brought to Maturation, which is the common and conſtant Practice. In ſome Caſes the Tumor turns ſuddenly to Suppuration, and in others it remains for ſome Weeks without being any thing ſofter. When this is the Caſe, it is neceſſary to continue the uſe of the forementioned Remedies, till the Tumor either breaks of itſelf, or is fit to be opened like

other

other Abſceſſes by Inciſion with the Scalpel, that the peſtilential Matter may be diſcharged and prevented from returning into the Blood.

IX. When the Abſceſs is thus opened, we muſt proceed directly to the cleanſing of it, and, after the cleanſing, the Wound is to be healed with ſome vulnerary Balſam, as we before propoſed. To deterge and cleanſe, the beſt that can be uſed here is *Ung. Digeſt. cum Theriac. Balſ. Sulph. Terebinth. portiunculâ permixtum.* At each Dreſſing the Matter is to be gently diſcharged from the Ulcer, and, when cleanſed, it is to be treated with the forementioned Ointment; but without Tents, unleſs its Opening ſhould be very narrow; then applying ſome proper Plaſter, it may be bound up again as before. The beſt Plaſters for this Purpoſe are the *Empl. Diachyl.* or that made *ex Melle & Farinâ*, the uſe of which may be continued till it is perfectly healed up. Treatment after Aperation.

X. With regard to the Time of opening the Abſceſs by Inciſion, Phyſicians are not agreed upon it; for there are many, eſpecially of the modern Authors, who have wrote on the Plague, that forbid the Opening of Peſtilential *Bubos* till they are perfectly ripe and ſoft: Beſides, theſe *Bubos*, agreeable to the Obſervation of many, do generally ſuppurate and break of themſelves; inſomuch that in the Opinion of theſe Gentlemen, an Opening made by Inciſion too ſoon, may greatly endanger the bringing on ill conditioned *Fiſtulæ*, a Stiffneſs in the Limb, and even a Gangrene. Others, on the contrary, will have it, that an Opening made by Inciſion in the very beginning of the *Bubo*, is not only without Danger, but even directly ſuited to preſerve the Patient, and recovering him the ſooner from his dreadful Diſeaſe. *Vid.* EPHEM. *Nat. Curioſ. Cent.* VII. *Obſ.* 69. *pag.* 170. The Inciſion is not to be made too ſoon.

XI. Notwithſtanding ſeveral of the ancient Phyſicians have contended for a ſpeedy and entire Extirpation of Peſtilental *Bubos* by the Knife, in order to diſcharge the contagious Venom; yet the Moderns do not without Reaſon diſſent from their Opinion: For ſuch a method of Cure is not only found to be too harſh, but alſo of very dangerous Conſequence in many Parts of the Body. In like manner, all Emetics, Cathartics, Bleeding, and hot cordial Medicines are, by the unanimous Conſent of the Moderns, condemned as things very pernicious in the Peſtilence; notwithſtanding they were held in ſo great Eſteem by the Ancients; ſuch were the Bezoartic Tinctures, hot Eſſential Oils, and volatile Antipeſtilential Spirits, together with the *Theriaca* and *Mithridate*.

CHAP. X.

Of the Preſervatives particularly neceſſary to defend and preſerve the Phyſician or Surgeon from peſtilential Contagion.

I. HITHERTO we have been treating of Peſtilential *Bubos*; but before we proceed to Carbuncles and *Anthraces*, it will be proper to ſay ſomething of the means that may be uſed by the Surgeon to defend himſelf from the peſtilential Contagion, that he eſcape free in viſiting the infected. But before we take upon us this Taſk, it will be firſt proper to inform our Reader that we believe there has not ever been yet found a certain Preſervative for this Purpoſe; ſo far from it, that many of the Remedies purpoſely contrived Preſervatives hitherto uncertain.

and recommended, are wholly uſeleſs and improper, even ſome of them are very dangerous when lodged in imprudent Hands, and are therefore to be cautiouſly avoided.

Which of theſe Methods are to be avoided.

II. There are many who aſſert frequent Purging to be wonderfully adapted to carry the peſtilential Contagion off the Body, and prevent it from getting into the Blood. There are others who lay great Streſs upon ſudorific Medicines, Scarifications, and frequent Bleeding, as of great Service to defend the Body from the peſtilential *Virus*; whereas all of them, unleſs the Body is habituated to them, are great Deſtroyers of the Strength; and by that means, rather than defend, they make the Body more obnoxious to and ſuſceptible of the contagious Venom; others again believe nothing more effectual as a Preſervative againſt the Contagion, than the frequent and plentiful drinking of certain hot Spirits or Waters, dignified commonly with the Title of Epidemic or Antipeſtilential. But we ſhall be ready to judge the uſe of theſe alſo to be equally foreign and altogether improper, if we do but conſider what violent Heats the plentiful uſe of ſuch ſpirituous Liquors will excite in the Blood, beyond what it ſhould naturally ſuffer, and by that means it may be rendered more liable to fall into a Peſtilential Fever; unleſs the Perſon has been accuſtomed to the uſe of ſuch Liquors before, or elſe uſes them with great Moderation: The ſame Judgment we muſt alſo paſs upon the common Spirit of Wine, *Aqua Vitæ*, and the alexipharmic Electuaries and Oils, with all other heating Medicines, ſince their Nature and Effects are directly the ſame. Laſtly, there are ſtill others who confide in things hung about the Neck, as Arſenic, Mercury, Sand, Camphire, and *Rad. Colchici*; or elſe the keeping open large Iſſues, from all which they expect a ſecure Defence from the Plague; when at the ſame time there can be found little or no Virtue in either, or all of them, to reſiſt the peſtilential *Virus*.

The beſt Defence againſt the Plague;

III. The beſt and readieſt Defence againſt the Plague ſeems in general to conſiſt in this, that ſuch as are able ſhould remove out of the peſtilential or infected Air into ſome healthy Part of the Country; or wherever they are, they ſhould keep from the Company of ſuch as are already infected, and not meddle with their Cloaths, Bedding, Meat, Drink, or Veſſels, and above all, not to make themſelves over afraid of the Diſeaſe; but let them always keep a chearful and confident Mind, with a proper Diet. But for the Phyſician and Surgeon, whoſe Buſineſs is to relieve the Sick, and for that Purpoſe muſt enter dangerous Places, it is beſt for them to keep up a courageous Mind, and not be anxiouſly afraid of Diſeaſes, nor even the Plague; for it is to be hoped that theſe who riſque themſelves with theſe Precautions to ſuccour peſtilential Patients, will be preſerved in Safety by a Divine Providence.

(1.) before we viſit the Patient;

IV. But beſides, there are ſeveral human Cautions and Obſervations neceſſary to be regarded by the Phyſician and Surgeon; the chief of which are, that *they ſhould never go faſting to viſit a Patient ſick of any contagious Diſeaſe, and much more of the Plague*; but they ſhould always eat ſomething, and drink ſome ſtrong Liquor before hand, in order to defend themſelves from the peſtilential Contagion and infected Air. Some Phyſicians therefore always *eat Bread and Butter, and drink a Draught of* Spaniſh *or Wormwood Wine*, or ſome other ſtrong Wine, before they offer to ſet a Foot in the Patient's Houſe; for by this method, the celebrated Dr. Hodges writes that he preſerved himſelf from Infection in the violent Plague at *London*, chiefly by drinking *Spaniſh* Wine:

Others

Others prepare themſelves in a Morning, *by eating a ſlice of Bread ſoaked in good Vinegar*, either ſimple, or wherein Rue has been infuſed. SYLVIUS has contrived an acidulated Medicine purpoſely for this uſe, which the Apothecaries call *Aqua Prophylactica* SYLVII, and is to be drank to the quantity of one or two Spoonfuls in a Morning, either alone or with a ſlice of Bread, by ſuch Surgeons as are going to viſit peſtilential Patients: Others again aſſert it to be confirmed by Experience that ſome good Broth or Suppings, eſpecially of Chocolate, are of great ſervice in keeping off the peſtilential Venom.

V. Being come to the Patient's Apartment, great Care muſt be always taken *that we neither eat nor drink there, nor even ſwallow our Spittle.* For there is no ſmall Danger in that Caſe, of ſwallowing the volatile peſtilential Exhalations or Effluvia, by which means our internal *Viſcera* and Blood would be infected: For which Reaſon we cannot approve of the Cuſtom of ſome who are continually chewing and ſwallowing Myrrh, Cinnamon, Angelica, Zedoary, or the like, all the time they are in an infected Place. For as ſuch things excite a plentiful Diſcharge of *Saliva* into the Mouth, it is hardly poſſible but ſome of the infectious Effluvia will be intangled therein, and ſo go down into the Stomach and get into the Blood. But the chewing of ſuch Aromatics may be very proper at home, as they are in their own Nature wholſom; the uſe of them in the former Caſe being improper only as to Time and Place. We ought alſo to be particularly careful *not to ſtay longer in the infected Place or Apartment of the Patient than our Buſineſs really requires:* For it is very dangerous in that Caſe leſt the Strength of our Conſtitution, however conſiderable, ſhould be overcome by the too great Quantity and Force of the peſtilential *Virus*; whereas we might have eaſily reſiſted and ſuſtained a ſmall Quantity of the ſame infectious Effluvia.

(2.) while we are with the infected Patient.

VI. After we are returned home from the Patient, it is much the ſafeſt way to waſh our Hands and Mouth well with Vinegar mixed with Water; for if there be any thing prevailing againſt the peſtilential Venom, Vinegar ſeems to be the chief. The Cloaths are to be changed for others, and expoſed to the free Air, and to be afterwards perfumed; then Suppings of Coffee, or Tea of *Scordium*, Sage, and the other alexipharmic Herbs ſhould be plentifully uſed; for theſe excite a gentle Sweat, and ſo drive out ſuch contagious Particles as might happen to be mixed with the Blood, keeping it free and temperate.

(3.) when we are returned home from the Patient.

VII. As an accurate Regimen of the Diet is always healthful in other Caſes, ſo alſo in Places where the Peſtilence rages it is found to be altogether neceſſary; therefore ſo much Aliment, ſolid and fluid, is always to be taken at one time, as is requiſite to keep up the Strength of the Body, and may be conveniently and perfectly digeſted. But Care muſt be taken not to burthen Nature therewith; for it can ſcarce be ſaid how vaſtly Intemperance weakens the Stomach and Body, and renders it liable to contagious Diſtempers; from the Crudities and undigeſted or corrupt Matter which is by that means lodged in the Blood. Modern Phyſicians obſerve that there is no Occaſion for chuſing a particular *Diet*; ordinary or common Food may be taken as uſual, if it be not againſt Cuſtom and Temperance. In Broths and Suppings ſhould be always mixed, whenever it can be done conveniently, ſome Vinegar or the expreſſed Juice of Lemons or Citrons, a few Capers, or ſome other ſubacid thing of the like kind; for the uſe of every thing gently acid is uſually very ſafe and bene-

A proper Diet is to be ſtrictly obſerved.

ficial in the Peſtilence; ſo that a moderate Plenty of all ſorts of Pickles are in this Caſe found very ſalutary. There is no need of any great change in the common and daily *Drinks*, only they ſhould be ſuited to the Strength of the Conſtitution and Stomach; for ſuch as drink *Spaniſh* or other rich Wines, ſhould conſider they are ſwallowing Food at the ſame time. If any one be accuſtomed to Tobacco, I would adviſe him to keep up the Habit; but I would not perſuade ſuch as diſlike it, or are of a hot Conſtitution, to the uſe thereof, to take Tobacco againſt their natural Appetite as a Preſervative from the Peſtilence; for I think it has been this long time obſerved that lovers of Tobacco have been equally as often and eaſily ſeized by the Plague as others who do not uſe it. Laſtly, if any body has been before accuſtomed to the uſe of Stomachics, Sudorifics, Vomiting, Purging, Scarification, Bleeding, and the like, at certain Times or Seaſons, they muſt be cautious not to break off too ſuddenly from ſuch Habits, but rather to continue them at their ſtated Times. But for Coition, as it greatly weakens and even ruins the Conſtitution at ſuch an unfavourable time, eſpecially if the Habit of the Body be naturally infirm, that ſhould be equally avoided with the Peſtilence itſelf.

External Helps againſt the Plague.

VIII. In the laſt place, in order to keep off or correct the peſtilential Effluvia, it will not be improper frequently to hold a Sponge to the Noſe which has been firſt wetted with ſimple Vinegar, or that wherein Rue or Lavender has been infuſed; the Chamber ſhould alſo be fumigated with Juniper Chips, Gunpowder and Brimſtone, or with Vinegar, ſprinkled upon a red hot Tile or Iron, in order to expel and correct the peſtilential Air.

CHAP. XI.

Of CARBUNCLES *or* ANTHRACES.

A Carbuncle what.

I. A CARBUNCLE is ſaid to be an Inflammation which ariſes in time of the Plague with a Veſicle or Bliſter, almoſt like thoſe produced by Burning. But this ſort of Inflammation generally terminates in a *Sphacelus*, and putrifies the ſubjacent Parts down to the Bone, they becoming as black as a Coal: And this ſeems to be the Reaſon why they are by the *Latins* termed *Carbunculi*, and by the *Greeks Anthraces*.

The Nature of Carbuncles.

II. A Carbuncle always breaks out very ſpeedily, even in the ſpace of an Hour or two, attended with Heat and Pain. Upon opening it, there is diſcharged a darkiſh and ſometimes limpid or watry *Sanies*; within, the Fleſh is of a black Colour, a *Sphacelus* having then ſeized the Parts, which ſpreads more and more by degrees; but the putrid Fleſh in thoſe who recover, ſuppurates and parts from the ſound. The ſize of theſe peſtilential Bliſters is various, more or leſs, as is alſo their number in the ſame Patient: For there is no Part of the Body which they do not infeſt; and they generally appear in company with *Bubos*, even they are ſeldom or never to be obſerved without *Bubos*.

Cauſes.

III. The immediate and uſual Cauſe of Carbuncles is doubtleſs a violent Inflammation, excited in the Blood by the peſtilential Venom. The Inflammation is ſpeedily and ſuddenly followed by a Corruption and Sphacelation of the Parts; but the Parts and Juices do not ſuppurate into Matter, as is uſual in other Tumors,

mors, but whatever is internally corrupted ſeparates and entirely falls off: For the inflamed Parts ſuppurate at the Margin or Extremity of the Inflammation, ſo that if the Patient does not die ſuddenly, the ſphacelated Parts which have the Carbuncle are by that means ſeparated from the ſound and living Parts, and are by degrees wholly caſt off.

IV. Experience witneſſes, that the Events of a Carbuncle are very doubtful, and much worſe than thoſe of *Bubos*, eſpecially if the Eruptions turn directly either livid or black: But when the Puſtules are red at firſt, and then gradually turn to a Citron Colour, the Danger is much leſs. Thoſe Carbuncles which ariſe in the Face, Neck, Breaſt, or in the Arm-pits, are obſerved to be of the worſt kind; for they generally kill the Patient. *Prognoſis.*

V. As for the internal Treatment of Carbuncles, whether by Diet or Medicines, the very ſame is to be obſerved in this Caſe with what we recommended in *Chap.* IX. §. 7. of peſtilential *Bubos*. For the chief of the Cure conſiſts in keeping the Patient in a gentle and conſtant breathing Sweat. Internal Treatment.

VI. The chief Deſign of the external Treatment is to quicken, as much as poſſible, the Separation of the ſphacelated Parts with the Carbuncle from the ſound. Therefore ſome of the modern Phyſicians uſe only Scarification in this Caſe, with very good Succeſs; for by filling the corrupted Parts with Inciſions, they let out the acrimonious and peſtilential Matter with the corrupted Blood. Others only open the Eruptions with a Pair of Sciſſors, and having diſcharged the Matter they often waſh the Carbuncle with *Sp. Vin. Camph.* or *Sp. Vin.* wherein has been digeſted a little *Theriaca*: They afterwards apply a maturating Cataplaſm, like the following: External Treatment.

℞ *Mellis cochlearia* iv, *Fermenti cochlearia* iij. *Vitell. Ovor. N°* ij. *Sapon.* ℥ ß. *Quæ probè commiſceantur calidáque ſuperimponantur. Vel,*

℞ *Farinæ Siligin. vel Tritic.* ℥ ij. *Aceti* ℥ ß. *quæ ex Aquâ vel Lacte ebutyrato decocta atque in Cataplaſma converſa cum Mellis* ℥ j. *Crocique contriti* ℥ j. *miſceantur, calidáque ſæpiſſime macerentur.*

VII. The Application of the forementioned Cataplaſms is to be continued till the Carbuncle ſeparates or caſts off from the ſound Parts: For it is better to diſſolve the Carbuncle gradually from the adjacent ſound Parts, than to cut it out all at once. Nor are Inſtances wanting where the Patient has been killed by an unſeaſonable and entire Extirpation of the Fleſh and Carbuncle; for we learn by Obſervation, that moſt ſharp Pains and other dangerous Symptoms uſually follow ſuch an over-powerful Remedy. But where the greateſt Part of the Carbuncle is already ſeparated from the live Fleſh, the Remainder may be ſafely divided by the Scalpel. Whether the Carbuncle ſhould be cut out.

VIII. But if an ill conditioned luxuriant Fleſh grow internally, either of itſelf, or from the Extirpation being made too ſoon, it is upon all accounts neceſſary to entirely conſume it by the Application of *Ung. Ægyptiacum vel fuſcum* WURTZII, or elſe by the Ointment following:

℞ *Mellis cochlearia* ij. *Vitell. Ovor. N°* ij. *Alum. uſti pulv. Gentianæ, Ariſtolochiæ ana* ℥ j. *m. f. Unguentum.*

IX. If

How to remove a ſupervening Gangrene.

IX. If the Inflammation inclines the adjacent Parts to a Gangrene, which is not unuſual, it will be proper to uſe the following Ointment:

℞ ʘ *Abſinth.* ℥ ß. *Herb. Scord. Flor. Sambuc. Chamæmel. ana* M j. *Aq. ſimpl.* ℔ ij ſß

When theſe have been well boiled and ſtrained, mix of the beſt *Sp. Vin. Camph.* ℥ vj. *Theriac.* ℥ ij. then let it be applied very often and hot to the Parts, by means of Linen Rags folded together, or Compreſſes, till the Violence of the Inflammation abates.

What is to be done after a Separation of the Carbuncle.

X. But when theſe very bad Symptoms are abſent, after a Separation of the Carbuncle from the live Parts, it will be proper to cleanſe the Ulcer with *Ung. fuſc.* WURTZII, or the digeſtive Ointment before deſcribed in *Chap.* IX. §. 5. of peſtilential *Bubos*. And this ſhould be done perfectly, leſt any of the peſtilential Venom ſhould remain behind, and excite the former Symptoms again; therefore the Deterſion of the Ulcer ought to be continued till there remains nothing of theſe peſtilential Symptoms; and when that is effected, the Wound may be healed like other Abſceſſes: More eſpecially it ſhould be dreſſed with Lint dipped in *Eſſent. Myrrhæ & Aloës*, applying over an *Emplaſt. de Lithargyro*, or the like, till the Ulcer is perfectly cured.

Whether Cauteries are to be applied.

XI. There are many of the more celebrated Phyſicians who allow nothing to be more effectual in extirpating and curing Carbuncles than the actual Cautery, or a red hot Iron. With this they order the dead Parts to be burnt till the Fleſh becomes in every Part ſenſible of the Pain, by which means there ſeems to be no Reliques left of the Carbuncle. This Method was obſerved by Dr. HODGES to be the readieſt way of Cure for Carbuncles in the great Plague at *London*. But there are abundance of Circumſtances which prohibit the forementioned Method of Cure by the Cautery from being uſed in many Caſes; as the Dread of the Patient, the Tenderneſs and Conſequence of the Parts, *&c.* which rather perſuade to the uſe of ſuch Methods as we have before propoſed; which are therefore to be made uſe of here.

Whether it be proper to apply *Butyrum Antimonii*.

XII. The celebrated SYLVIUS thought *Butyrum Antimonii* an efficacious Remedy to extirpate Carbuncles, if the circumjacent Parts were anointed with it: For in the Opinion of SYLVIUS it not only prevents the Diſorder from ſpreading, but it alſo readily makes an Eſchar that divides the ſound Parts from thoſe which are corrupted, and at length wholly ſeparates them. But ſuch of the modern Phyſicians as have wrote profeſſedly on the Plague at *Vienna* and *Ratiſbon*, do by no means agree with him: For if we may believe theſe, the *Butyrum Antimonii* is ſo far from being ſerviceable in Carbuncles, that it rather excites the worſt of Symptoms, and often brings ſudden Death. In the mean time we find BOTTICHERUS aſſenting to the Opinion of SYLVIUS, in his *Loimographia Hafnienſis*; where he frequently praiſes and recommends the *Butyrum Antimonii* as an excellent Remedy for this Purpoſe. But whichever be the Caſe, the Method by uſing *Butyrum Antimonii* is in my Opinion more ſafe and preferable to the way of Cure by the Cautery. Laſtly, whichever of theſe Methods of Cure are practiſed, the Buſineſs afterwards will be always firſt to perfectly cleanſe the Wound, and then to heal it up.

CHAP.

CHAP. XII.

Of VENEREAL BUBOS.

I. A VENEREAL *Bubo* is a Tumor with Pain and Inflammation ariſing in the Groins or Arm-pits, after Contact with an impure Woman. *Bubos* of this kind are diſtinguiſhed into two ſorts: (1.) Such as ariſe without any other Symptoms of the Venereal Diſeaſe; or, (2.) thoſe which are accompanied with the other uſual Attendants of the Diſeaſe, as a *Gonorrhœa*, and Venereal Ulcers uſually termed Shancres. What a Venereal *Bubo* is.

II. *Bubos* of this kind uſually ariſe, as we before obſerved, after Contact with an impure Woman, who is afflicted with the Venereal Diſeaſe; after which they ariſe ſometimes ſooner and ſometimes later, that is, within a few Days after Infection. The Tumor then ariſes in the Patient with Hardneſs, Redneſs, and Pain, either in one or both the Groins, and ſometimes in the Arm-pits. So that if we regard the Colour of Venereal *Bubos*, there is little or no Difference between them and the Benign ſort. See *Chap.* VIII. foregoing. Care muſt therefore be always taken that we do not miſtake one for the other: For ſuch as take Benign *Bubos* for Venereal ones, generally treat them with Suſpicion, Contempt, and a harſh method of Cure. On the other Hand, when Venereal *Bubos* are miſtaken for Benign ones, there is Danger leſt the Patient, being treated in the mild Method ſuited to Benign *Bubos*, ſhould be unhappily brought into a confirmed *Lues*. Symptoms.

III. The moſt certain Signs that theſe *Bubos* are Venereal, are the Patient's having had to do with unclean Women, and from their being or having been accompanied with a *Gonorrhœa*, Shancres, or other Symptoms of the Venereal Diſeaſe. When any of theſe are preſent, they give ſtrong Reaſon to ſuppoſe the *Bubo* to be Venereal; but when they are abſent, they take off or at leaſt greatly diminiſh the Probability of the *Bubos* being virulent. As ſoon as it appears from the Patient's Confeſſion, or other Circumſtances, that the *Bubos* are venereal, we muſt proceed accordingly with expedition to a proper Method of Cure. Though this Diſorder generally admits a pretty eaſy Cure at the Beginning, yet, when the Lymph comes to be affected by it, either from Delay, improper Treatment, or an irregular Courſe of Life, a Cure becomes then extremely difficult, and it frequently turns into the *Lues* itſelf. Diagnoſis.

IV. With regard to the Cure, there are many Phyſicians who hold a Diſperſion of Venereal *Bubos* equally improper with the Peſtilential; becauſe by that Method the venereal Venom returns, contrary to the Deſign of Nature, into the ſmall Veſſels, and, by infecting the Blood, brings on a Pox. They therefore judge it neceſſary to abſtain entirely from Bleeding and Purging, and to forward the Tumor to Suppuration as faſt as poſſible. But with Submiſſion to theſe Authors, I cannot be of their Opinion: For the Cure by Suppuration is not only ſlow and tedious, but alſo attended with many Inconveniences; whereas I have frequently experienced with the greateſt Safety, much better Effects from the taking of Cathartic and Mercurial Medicines, together with a Decoction of the Woods, and other ſuch Purifiers of the Blood: For by this means the Virulency may be diſcharged from the Body much ſooner than by Suppuration; Whether a Diſperſion be ſafe.

and

and the Tumors may be ſafely diſperſed without Danger of a *Lues* or other bad Symptoms.

How the Diſperſion is to be effected.

V. Whether the Patient have a *Gonorrhœa* or not, the beſt way is to purge him with frequent and large Doſes of *Merc. dulc.* as is uſual in carrying off *Gonorrhœas:* For in curing a *Gonorrhœa*, you alſo cure *Bubos*, generally at the ſame time and by the ſame means. Nor can *Bubos* be happily cured till the Body is firſt quite freed from the venereal Venom. When there is a conſiderable Inflammation, in young plethoric Habits of Body, it ſeems to be altogether neceſſary to bleed, and give mecurial Purges afterwards, with a Decoction of the Woods, and Eſſences which purify the Blood. Externally to the Tumor ſhould be applied ſome diſcutient Plaſter, as *Emp. de Meliloto, de Ranis cum Mercurio, Diachylon*, or the like: At the ſame time the Patient ſhould keep ſtrictly to a regular Diet and courſe of Life; taking ſcarce any thing but Ptiſans made with Barley, Oats, or the like. In room of ordinary Drink may be taken a Ptiſan, made of Barley, Liquorice, and Aniſe, or Fennel; for a Change may be drank a Decoction of the Woods, and for a greater Variety, a little clear and very ſmall Beer. Wine and all other ſtrong fermented Liquors ſhould be carefully avoided, as they generally encreaſe the Inflammation. If the Patient be kept up carefully to theſe Reſtrictions, Venereal *Bubos* which are not yet inveterate, may be diſperſed very commodiouſly and without any Danger.

Suppuration how to be promoted.

VI. But if Advice ſhould be called in too late, or the *Bubo* prove ſo obſtinate as not to give way to Diſperſion, or if upon any other account the Surgeon is deſirous to effect a Cure in the way of Suppuration, in order to diſcharge the *Virus* and prevent a *Lues*, he is to diligently promote and quicken the Maturation as faſt as poſſible. But the moſt powerful Medicines to promote Suppuration have been mentioned at *Chap.* III. §. 4. and *Chap.* IV. §. 8. Though it is beſides not improper here to rub the *Bubo* with Linen Rags or the Fingers greaſed with Butter or Oil till they grow red with Pain, adding afterwards a maturating Plaſter; for by this means a Suppuration is greatly promoted and accelerated. The Plaſter to be afterwards applied may be of *Diachylon cum Gummis, vel de Galbano*, particularly when the Patient can as yet walk pretty well. The Plaſter may be taken off, and the *Bubo* rubbed well, three or four times a Day, more or leſs, agreeable to the ſeveral Circumſtances. Violent dancing, boxing, fencing, and other ſuch Exerciſes are alſo here very ſerviceable for promoting the Suppuration. But if the Patient cannot walk any longer from his Pains, which is frequently the Caſe, it may be proper to apply a maturating Cataplaſm inſtead of a Plaſter, ſuch as we have deſcribed in the Chapters juſt now mentioned, which are uſually much more effectual than Plaſters. The beſt of theſe Cataplaſms for this Caſe, are thoſe *ex Cepis ſub cinere toſtis, vel Farinâ & Melle, vel ex Fermento, vel denique ex micâ Panis Siliginei cum Lacte atque Croco decoctâ*, which are to be now and then applied warm to the Parts, after they have been firſt well rubbed.

Internal Treatment.

VII. While the former are carrying on, internal Medicines muſt be alſo called in to Aſſiſtance. The Patient ſhould take a warm Draught of a Decoction of the Woods two or three times in a Day, about eight, ten, or twelve Ounces at a time, with thirty or forty Drops of *Eſſent. Lignor. Pimpinellæ, albæ Fumariæ, vel Scordii, vel his ſimilium, & Mercurii dulcis aliquot grana quotidie.* For as theſe greatly attenuate the Blood, drive it towards the Skin, and correct

rect the venereal Venom, they alſo greatly promote either a Diſperſion or a Suppuration.

VIII. Theſe Methods are to be followed till the *Bubo* comes either to a Diſperſion or Maturation. When the Tumor appears to be perfectly ſuppurated, the Scalpel is to be taken in hand, in order to make an Inciſion upon the *Bubo*; but then it muſt be done with Caution, to avoid hurting any of the large Blood Veſſels in either the *Inguen* or *Axilla*, from whence might enſue a very dangerous Hæmorrhage. The better to avoid injuring theſe Veſſels, the protuberant part of the *Bubo* ſhould be preſſed outwards by the Fingers. But with regard to the Time in which it is proper to make the Inciſion, it muſt be always carefully obſerved not to let it be too ſoon nor too late; becauſe both are dangerous: For when they are opened too ſoon, it occaſions Pains, violent Inflammation, and other bad Symptoms; as when they are delay'd too late till they are inciſed, it generally occaſions (as HILDANUS witneſſes) the corrupt Matter to return into the Blood, and by infecting the whole Maſs, brings on a confirmed *Lues*. If the Patient dreads the Knife, the *Bubo* may then be opened by a Cauſtic. Here the Reader ſhould turn to what we have ſaid before on Abſceſſes, *Chap.* III. §. 10, *ſeq.* When the Matter is once diſcharged, it will be proper to cleanſe the Ulcer with ſome digeſtive Ointment, mix'd with ſome *Theriaca* and a little *Merc. Præcip. Rub.* afterwards may be applied a Plaſter of *Diachylon cum Gummis*; by which means the Lips of the *Bubo* will be ſufficiently ſoftened and cleanſed; and then it may be healed with ſome vulnerary Balſam, applied on ſcraped Lint.

The manner in which *Bubos* are to be opened.

IX. Sometimes the ulcerated *Bubo* becomes ſo ſtubborn, that it will neither incarn nor cicatrize, by the help of any Medicines; but always affords a copious Diſcharge of Matter. When this is the Caſe, and the forementioned Medicines have been uſed to no Purpoſe, *viz. Præcip. Rub. & Alum. uſt.* prove alſo to be of no Service, there then remains no other probable Method, in my Opinion, than to cauterize the corrupted Parts to the quick by the actual Cautery: For by that means the Communication of the infected Lymphatics may be cut off. From what we have hitherto propoſed, it ſeems to be ſufficiently apparent that it is always ſafer and more convenient to bring venereal *Bubos* to a ſpeedy Diſperſion or Reſolution, when a Cure may be that way effected, than to bring them ſlowly to a Suppuration. But when the Blood is found too much infected, and already corrupted by the venereal Venom, ſo that a confirmed *Lues* begins to ſhew itſelf, the Cure by Suppuration may be then both proper and requiſite.

Whether and when the actual Cautery ſhould be uſed.

CHAP. XIII.

Of CHILBLAINS.

I. WE generally give the Name of *Chilblains* to thoſe Tumors which happen in the Hands and Feet from violent Cold; they being at the ſame time accompanied with Inflammation, Heat, Redneſs, pricking Pain and Immobility in that Limb. Sometimes they are of a livid or leaden Colour, and ſometimes they break out with Scabs, or elſe with Chaps or Slits, which afterwards

Chilblains, what they are.

terwards penetrate deeper and become ulcerous. The Humour which they discharge is ſometimes a little fetid, and pretty much reſembles *Pus* or *Sanies*. The Inflammation alſo frequently turns to a *Sphacelus*. So that I think we may readily conclude hence, that Chilblains wholly belong and ought to be referred to the Tribe of Inflammations; the more becauſe they excite the ſame Senſe of Heat or Burning with other Inflammations, and do like them terminate in either Diſperſion, Suppuration, or Gangrene and *Sphacelus*.

Diagnoſis. II. Chilblains may be known and diſcovered by ſeveral means: For (1.) we may obſerve the common Signs of Inflammation which we have but juſt now mentioned; (2.) we muſt enquire whether the Patient afflicted with them has been ever previouſly affected in thoſe Limbs with vehement Cold or Froſts, to which Travellers and Soldiers who are engaged in Winter Expeditions and Sieges, are often greatly expoſed. Laſtly (3.) it is alſo a Sign that they are Chilblains when the Patient feels prickings or ſhooting in the Part, with Heat and violent Itching; and when the Part affected is found inflexible and almoſt inſenſible.

The Degrees of this Diſorder. III. While the Chilblains are yet tumified and red, and the Part retains its Senſe and Motion without any great Heat and Pain remaining, the Diſorder is then of the mildeſt kind: On the contrary, when they turn livid, occaſion the Limb to become ſtiff and inſenſible, or excite pricking Pains therein; there is then Danger of a worſe Conſequence, leſt it ſhould degenerate into a Gangrene, or, at leaſt, a deep Exulceration. When the Skin riſes into Puſtules or Bliſters, like what frequently happens in Burns and violent Scalds, it is a ſign that there is an incipient Gangrene upon the Part. Laſtly, when the Member loſes its Senſibility, turns livid, ſoft, and flaccid, there is great Reaſon to ſuſpect that it is then dead, and corrupting with a *Sphacelus*.

Cauſe. IV. We have no room to doubt but that the real Cauſe of Chilblains is the Cold. For by violent Cold, the Mouths of the ſmall Blood Veſſels are not only greatly contracted, but the Blood is alſo by the ſame means rendered too thick; which are the two great Cauſes of all Inflammation. Nor is there any Symptom that attends this Diſorder, but what may be readily explained as a Conſequence of theſe Cauſes.

The Nature of Cold. V. Though Naturaliſts are not yet well agreed among themſelves concerning the true Nature of Cold, yet I cannot conſent to the Opinion of thoſe who look upon Cold to be only the Effect of a Privation or Abſence of Heat; but I rather judge it to conſiſt in [a] certain hard, ſharp, rigid, and ſaline Particles, which float in the Air; which are, by the Preſence of Heat, rendered very minute, ſoft, flexible and volatile; but, upon the approach of Cold, they coaleſce and become rigid. Now when theſe Particles inſinuate themſelves into the ſmall Pores of the Body, they conſtringe the ſmall Veſſels, and by wounding them, either inſpiſſate or ſtop the Blood. Hence (in my Judgment) we may perceive the Reaſon why the Cold ſlits or cleaves the Skin of the Face, Lips, and other external Parts, and afterwards afflicts them with continual prickings and ſhootings: For the leſs Motion and Heat the Blood has in any Part, it is generally impelled into thoſe Veſſels with a leſs Force. So that it is no wonder if the Hands, Feet, Heels, Fingers, Toes, Noſe, Ears, *&c.* are more frequently afflicted with

[a] *W.* HAMBERGERI *Diſſ. de Frigore.*

Chilblains

Chilblains than any other Parts of the Body; being ſometimes ſlight, but often very violent. Sometimes the Cold is ſo great as to quite ſtop the Courſe of the Blood throughout the whole Body; which then quickly kills the Patient; and we ſay commonly that he was frozen to Death, or periſhed with Cold.

VI. Though all Chiblains are in the general ſomewhat dangerous, yet they are more or leſs ſo in Proportion to the Extremity and Violence of the Cold which occaſions them; in Conſequence whereof, more or leſs grievous Symptoms ariſe. When the whole Hand or Foot is ſeized by the Cold, the Danger is generally greater than when it affects only a Finger or Toe. But nothing can be more fatiguing than that thoſe who have once been afflicted with Chilblains ſhould afterwards become liable, almoſt every Year, to Inflammations, Pains, Ulceration, and even Gangrene, upon the Approach of any great Froſt. Laſtly, when Chilblains are ill treated, by ſuddenly expoſing the Part from the Cold to a Fire, or any thing hot, or by wrapping it up in hot things; there is great Danger of the Part's becoming black, ſoft, and putrid; and at length, loſing all its Senſation, it may contract a *Sphacelus*. *Prognoſis.*

VII. Having found this to be the State of the Caſe, it readially follows that the Cure of all Chilblains muſt conſiſt chiefly in reſtoring the Blood to its former Fluidity and free Circulation as ſoon as poſſible. But the inſpiſſated Blood requires to be reſolved in this Caſe by Methods very different from thoſe generally uſed in other Inflammations. For the warm Medicines which are very beneficial and even abſolutely neceſſary in other Inflammations, are found to be extremely pernicious for Chilblains. Nor can it ever be ſafe for thoſe who have ſuffered extreme Cold, to expoſe themſelves preſently to Heat or a Fire: For Death has been often the Conſequence of ſuddenly expoſing the Body to the Viciſſitudes of Heat and Cold. It is therefore much more ſafe and convenient to expoſe the Patient firſt to an Air that is either cold or temperate, and to order him to continually exerciſe his Limbs as much as he poſſibly can, and laſtly, to advance him gradually to a ſtill greater Warmth or Heat. When the Patient is too weak to exerciſe himſelf, it will firſt be proper to bathe the Parts affected with Snow, or cold Water, which will ſeem to be hot to the Patient: By which means the ſharp ſaline *Spicula*, which ſtick in the Pores of the Skin, will be drawn out, and the Blood reſtored to its natural Circulation. Afterwards, when the Limb is become ſenſible, we may by degrees apply comforting Medicines; ſuch as *Sp. Vini meri, vel cum Theriacâ, Oleum item Petræ, Balſ. Sulph. &c.* When the Parts affected have been well rubbed and bathed with theſe, the Patient may then be advanced towards the Fire, or be put to Bed; endeavouring afterwards to excite a gentle Sweat. External Treatment.

VIII. To anſwer this Intention, great Service will be had from a few Glaſſes of hot Wine, wherein have been boiled ſome Cinnamon and Sugar: For by drinking or rather gradually ſupping of this, the Patient generally revives and grows warm, and the Blood recovers its Circulation. Though it may not be improper to give alternately with this, a ſmall Quantity of a ſudorific Mixture; as, Internal Treatment.

℞ *Aq. Galag. Rutæ, Scord. ana* ℥ij. *Theriacal. Vit. Matthiol. ana* ℥vj. *Prophylact. Sylv.* ℥ſs. *Mixtur. Simpl. vel Tinct. Bezoart.* ʒij. *Syrup. Cinnamon. Caryophyllor. ana* ℥ß. *Miſc.*

A little Draught of this, about three Spoons full, ſhould be given to the Patient every Quarter of an Hour, and the hot Wine as often, till we find the Appearance of a Sweat. If Wine be not at hand, good Ale boiled with Cinnamon, Cloves, and Sugar, may well enough ſupply its place. Such Suppings as theſe ſhould be continued ſo as to keep up a Sweat for a whole Hour, for half an Hour, or according to the ſeveral Circumſtances. For it can ſcarce be imagined how certain and expeditious this Method of Cure is for the moſt grievous Chilbalins, which even threaten a Gangrene. But if the Diſorders which proceed from Cold are much ſlighter, this Method is then not ſo directly neceſſary, but may be laid aſide, though it is much preferable to any other Method.

How a Suppuration or Gangrene is to be treated.

IX. When Chilblains tend to Suppuration, it is proper to treat them like other recent Abſceſſes: Firſt, to cleanſe the Wound with ſome digeſtive Ointment, as *Ægyptiacum*, *&c.* then to dreſs it with *Ol. Ovor. Ceræ*, *&c. vel Balſ. Peruvian. Eſſent. Aloës*, *Myrrhæ*, *&c.* and laſtly, to apply *Emplaſt. Saturnin. vel de Lithargyro.* Sometimes we ſhall find Benefit from *Oleum Myrrhæ per Deliquium*; as alſo from *Mures aduſti*, if we may believe the *Ephemerides Naturæ curioſorum.* Laſtly, a Mixture of *Aq. Calcis cum Sp. Vin. Camph.* will be frequently found of great Service here: If a Compreſs dipped therein be bound upon the Part, either alone, or after the Application of the forementioned Medicines. But if a Gangrene or *Sphacelus* appear, the Parts affected are then to be treated in the Method we ſhall propoſe in the following Chapter.

To prevent Chilblains.

X. If a Patient has before been troubled with Chilblains, which are uſed to return every Year, in the Winter; to prevent the Diſorder from returning again, he may arm himſelf by proper Medicines: The beſt preſervative for this purpoſe, is to anoint the Parts affected with *Petrolæum* or Oil of Turpentine, before and while the Severity of the Winter comes on; but when the Diſorder has begun to ſhew itſelf again by Tumor, Inflammation, and Pain, the diſordered Heel or Finger may be wrapped up in Swine's Bladder, dipped in the forementioned Oils. But the Cold itſelf ſhould be always carefully avoided, by defending himſelf well with proper Cloaths or Coverings. The Reader may conſult at his pleaſure M. A. SEVERINI *Diſſert. de Pernionibus in Lib. de Abſceſſibus.*

CHAP. XIV.

Of a GANGRENE *and* SPHACELUS.

What a Gangrene and *Sphacelus* are.

I. HITHERTO I think we have ſufficienly conſidered the *Exit* of an Inflammation by the way of Diſperſion or Suppuration; it follows that we now examine the third and laſt Method wherein an Inflammation terminates, *viz.* a Gangrene and *Sphacelus*, to which Diſorders the ancient Phyſicians gave the Name of *Cancrum*[a]. By a *Gangrene* we underſtand that moſt great and dangerous degree of Inflammation wherein the Parts affected begin to corrupt and put on a State of Putrifaction. But by a *Sphacelus* we un-

[a] *Vide* CELSUS *Lib.* V. *Cap.* XXVI. *N°* 31,—34.

derſtand

derſtand not an incipient but an abſolute and perfect Corruption or Death of the Parts already made.

II. A Gangrene may be diſcovered generally from the following Signs: Namely, the Inflammation, with its Symptoms, which have all along been very violent, do generally undergo a ſudden Change, as if they were going off. The Parts which were before ſwell'd and tenſe, do now become ſoft and flaccid, and upon preſſing with the Finger upon the Skin and Fat, its Impreſſion remains behind, as in an *Œdema*; at length the *Cuticula* ſeparates from the *Cutis*, often riſing up in Bliſters like thoſe in Burns, fill'd with a reddiſh, yellowiſh, and ſometimes black Humour, and the Senſe of the Limb is in ſome degree diminiſhed. The chief Mark whereby we diſcover a *Sphacelus* is, when after a previous Gangrene the Parts entirely loſe their Senſation, in ſuch a manner that the Fleſh may be pricked and cut without giving any Pain; and if the Gangrene penetrates deep, ſo as to affect the Nerves and Muſcles, the Limb alſo loſes its Power of Motion. Afterwards the Colour of the Part turns black by degrees, and the Skin feels cold and flaccid; and at length it adheres ſo looſely to the Fleſh, that it may be eaſily pull'd up and off from it. Sometimes the Skin becomes hard and dry, like the Rind of Bacon. Laſtly, it yields a moſt intolerable cadaverous Stench, and the *Sphacelus* ſpreads by degrees through the adjacent ſound Parts, unleſs there ſhould happen to be a Separation of the dead Parts from the ſound; though it frequently ſtops of itſelf, and by forming a circular Suppuration, the mortified Parts are caſt off from the ſound. *The Signs.*

III. The *Cauſes* of a *Gangrene* and *Sphacelus* are either external or internal. Among the *internal Cauſes* we reckon an *Eryſipelas*, and all other Inflammations which ariſe ſpontaneouſly, and can by no means be diſperſed nor brought to Suppuration. Inflammations of this kind uſually proceed from the Blood's being too acrimonious or corrupted by the Bile, or in a *Scorbutus*; or when the Circulation of the Blood is too quick or too ſlow, by reaſon of old Age or any other Weakneſs; or laſtly, when the Patient uſes a perverſe Courſe of Life, with reſpect to Diet and Paſſions of the Mind (eſpecially Anger, Grief, and Fear,) during the time of the Inflammation. By *external Cauſes* we intend Injuries from the Air, cold Water, and the Application of topical Remedies externally to the inflamed Parts, which are either cooling, aſtringent, fat, oily, or the like; together with all great external Hurts or Accidents which frequently happen to the Body through Falls, Blows, *&c.* as in Wounds, Fractures, Luxations, *&c.* *Cauſes.*

IV. A Gangrene is for the generality, never without Danger; becauſe it eaſily changes into a *Sphacelus* or entire Mortification, which never admits of a Cure but by taking off the dead Parts. But a Gangrene which is ſlight, incipient, and not ſpread far, but only affects the Skin and Fat, is not very difficult to cure, eſpecially when it happens in a young and ſtout Patient, in a mild and temperate Seaſon, and does little or no Injury to the Muſcles and Nerves: But the larger, more violent and confirmed is the Gangrene, and the faſter it ſpreads, the more difficult is it generally to effect a Cure; eſpecially in an old or weak Patient [b], or in an ill Habit of Body from a Dropſy, *Phthiſis*, or *Scorbutus*; the Weather alſo being too hot or very cold, or the Parts affected being near *Prognoſis.*

[b] New Inſtances may be ſeen of Death from a Gangrene in old People in LE DRAN's *Obſ.* 100 & 101. I have alſo been Eye-witneſs to many of the like Caſes.

the

the *Thorax* or *Abdomen* may make the Caſe more dangerous. Nor can this Caſe be neglected without the utmoſt Danger of Life; for the putrid Matter being abſorbed by the ſmall Veins and mixed with their Blood, is conveyed to the Heart and Brain, and corrupts the whole Maſs: From whence all the vital Actions are diſturbed, the Appetite goes off, and Phrenzy with Death follow. So alſo in large inveterate Ulcers, in the Extremities and Feet of old People, when they become dry and livid, it is almoſt a conſtant Sign that a *Sphacelus* and Death are at hand. Death is alſo preſaged in great Inflammations attended with Spaſms, continual Hiccoughs and Belchings, cold Sweats, Faintings, a *Delirium*, and continual Reſtleſſneſs or Drowſineſs, eſpecially if they happen in a Patient who is then afflicted with a Gangrene or *Sphacelus*. And laſtly, if the Gangrene be not directly treated with proper Medicines, it commonly turns ſuddenly into a *Sphacelus*; and if the ſphacelated Parts are not timely removed or amputated, the Diſorder ſpreads through the adjacent Parts, and brings on a ſpeedy Death.

The Cure conſiſts in three things,

V. We muſt therefore always endeavour to treat the Gangrene ſo as that it may not terminate in a *Sphacelus*. Firſt of all therefore, in plethoric and ſtrong Habits, we are to bleed largely, and to repeat the Operation at Diſcretion; but in weak Habits, it ſhould be omitted. The Remainder of the Treatment will conſiſt chiefly in obſerving the three following Directions:

(1.) A Removal of the external Cauſes.

(1.) *To be careful in the beginning to remove all violent external Cauſes of the Inflammation*; as too ſtrict a Bandage in Wounds and Fractures, all foreign Bodies which are ſtuck in the Parts, as Thorns, Splinters, Needles, *&c.* improper Medicines externally applied, as Ointments, Oils, and Plaſters with cooling and aſtringing things, as we before obſerved; all which ſhould be removed as ſoon as poſſible.

(2.) A proper Diet and internal Medicines.

VI. The other Obſervation reſpects chiefly the *keeping up of the Patient's Strength*, eſpecially in weak and old People. This may be beſt affected by ordering a Diet which not only affords good Juices, but is alſo well accommodated to the Age, Conſtitution, and other Circumſtances of the Patient. If the Patient is weak and in Years, is naturally of a cold Habit, has loſt much Blood and abounds with Acidities, the moſt ſuitable Diet will be Soops, and ſtrengthening Broths, ſuch as are made of Chicken or Capons, Beef, or ſome other good Fleſh, boiled with Mace, Ginger, or other Spices; as alſo Suppings of Ale boiled with the Yolks of Eggs, Cinnamon, and Sugar; Eggs themſelves poached ſoft, ſo as to be potable; ſtrong Jellies of Calves Feet, Hartſhorn and Ivory Shavings; old and rich Wines, as *Rheniſh*, *Hungarian*, *Spaniſh*, *Canaries*, &c. and laſtly, fine Ale may do very well, eſpecially for the Poor. With reſpect to Medicines, the moſt proper are the *Corroborantia*, uſually termed *Cordial*, as the Spirits, Eſſences, Powders, and Electuaries of that tribe, eſpecially made up or mix'd with *Confect. Alkermes*: At Intervals may be drank hot, Tea of Sage, *Scordium*, *Veronica*, and Herbs of the like Nature, with the addition of a little Cinnamon, or a few Shavings of *Lig. Saſſafræ*, *Santal. Citrin. &c.* for by theſe means the ſtagnating Blood will be wonderfully reſolved and attenuated, its ſound and healthy Parts will be retained in a due Circulation, and its noxious Parts will be diſcharged and diſſipated. It is alſo not improper in this Caſe, frequently to apply a Sponge to the Noſe or Carpal Arteries, which has been dipped in *Aq. Regin. Hungar.* alſo to bind it upon the Temples. In

like

like manner we ſhall find almoſt equal Benefit from the Crumb of Rye Bread mix'd up with powder'd Cloves; if it be firſt macerated in very ſtrong Vinegar, then made into a globular From, wrapped up in a Piece of Linen Cloth, and then frequently applied to the Noſe. For Patients who are of a more warm, ſanguine, or bilous Habit, Soops and Ptiſans mix'd with the acid Juice of Citrons or Lemons will be very proper Strengtheners; alſo Barley Gruel mixed with *Syr. Mali Citrei vel Mori, vel Rubi Idæi, vel Ribeſiorum aut Ceraſorum acidor.* to be taken daily as a common Drink. When the Heat is ſmall, the Patient weak, or before accuſtomed to Wine, it may be allowable to mix a little Wine with the Gruel, eſpecially *Rheniſh*, and ſometimes a Glaſs of rich Wine may be taken unmix'd at proper Intervals; at the ſame time not neglecting the other Medicines which are proper to be uſed in Fevers, ſuch as are mild, temperating, cooling, and cordial. But the *Cortex Peruvianus* [c] is by many celebrated in this Diſorder beyond any other internal Medicine, they look upon it as the only Medicine in this Caſe, and adminiſter it in the ſame manner as in Intermitting Fevers.

VII. The third and laſt Obſervation concerning the Treatment of a Gangrene is chiefly *to diſcharge the ſtagnating and corrupted Blood from the Parts affected, as ſoon as poſſible*, and to prevent the neighbouring Parts from being affected thereby. The principal Means to effect this, are (1.) to make uſe of proper internal *Corroborantia*, or ſtrengthening Medicines; (2.) to make *Scarifications (pro re natâ)* by the Scalpel upon the Parts affected, making the Inciſions very numerous lengthways upon the Parts, and of a ſufficient Depth, in order to diſcharge the ſtagnating and corrupted Blood, and to make way for the Ingreſs of the Virtues of the diſcutient Medicines which are applied externally, by which means they can the better penetrate through the ſmall Wounds to the internal Parts. Laſtly, (3.) diſcutient, ſtimulating, and balſamic *Fomentations* and *Cataplaſms* which reſiſt Putrifaction, are to be carefully applied to the diſordered Parts; of which kind is the following Fomentation: (3.) External Remedies.

℞ *Aquæ Calc. viv.* ℔ j. *Sp. Vin. Camph.* ℥iij. *Sal. Ammoniac.* ℥ ß. *M.*

This may be applied hot with Compreſſes, it being what I have very frequently experienced and ſtill continue to uſe with very good Succeſs in theſe Caſes, and in other Inflammations; a very extraordinary and uſeful Mixture is alſo made *ex Aq. Calc. viv.* ℔ j. *cum Mercur. dulc.* ℥ j. to be applied like the other. In the Hoſpital at *Amſterdam* the following excellent Fomentation was uſed with Succeſs in Gangrenes, within my Remembrance [d]:

℞ *Spirit. Vin.* ℥iij. *Pulv. Aloës, Myrrh. ana* ℥ ß. *Ung. Ægyptiac.* ℥iij. *M.*

Or, *Sp. Vin. cum Aloë, Myrrhâ, & Croco leniter coctus, vel Sp. Vin. Camph. cum Theriacâ mixtus, vel Sp. Theriacalis aut Matricalis cum ſextâ quaſi parte Elix. proprietat. roboratus*, or what GARENGEOT greatly extols, *Vinum calidum, Sp. Vin. ſimplic. vel Camphorâ roboratum, vel Sp. Vin. Camph. Sale Ammoniaco acuat.* which he extols as an excellent Remedy to revivify Parts which ſeem to be dying [e].

[c] Conſult WERLHEFFII *Obſ. de Febrib. p.* 332. taken from the Obſervations of RUSHWORTH, AMIAND and DOUGLAS. See alſo a particular Treatiſe publiſhed by DOUGLAS on Mortifications.

[d] *Vid.* KOENERDING *in Libello de Gangrænâ & Sphacelo, Belgico Sermone edito Amſt.* 1698, 8vo.

[e] Chirurgical Operations, in the Chap. of a Gangrene.

Or,

Or,

℞ *Fol. Scord. Abroton. Abſinth. Rut. recent. ana* M ij. *Flor. Chamæmel.* M j. *coq. in ſ. q. Aq. ſimpl. colentur.*

℞ *Hujus* ℔ ij. *adde Spirit. Vin. Theriacal.* ℥ iv. *Sapon. Venet.* ℥ ij. *Salis Gemmæ* ℥ ß. *M. f. Fomentum.*

This Fomentation is to be applied hot ſeveral times in a Day to the Parts affected, by means of Linen or Woollen Cloths; and to give a laſting Warmth, we may apply a hot Tile wrapped up in a thick Cloth, or a hot Bag of Sand.

A domeſtic Remedy for the Poor.

VIII. For the Poor in this Caſe, there is a cheap and domeſtic Remedy, recommended by SIMON PAULUS and others, *viz.* the *Pickle of Cabbages*. VALESIUS DE TARANTA has long before taught us, that Horſe or Cow Dung boiled in Vinegar or Wine makes an excellent Fomentation for this Purpoſe; but a long time after him, we are told that SYLVIUS and BARBET held the ſame Remedy as a Secret in this Diſeaſe; but the Filthineſs of the Medicine makes it unworthy a Phyſician, it being fitter for the Poor and Vulgar than People of Faſhion. But there is a neat as well as a very efficacious Fomentation for a Gangrene to be made of *Scordium*, Wormwood, and Southernwood, either ſeparate or mix'd, to be boil'd in Sea-water, or where that is not to be had, Salt-water or Vinegar to be applied hot like other Fomentations ſeveral times in a Day, giving a laſting Warmth by hot Bricks or Tiles, till the Diſorder diſperſes or diminiſhes. Thus there will be no occaſion to ſo frequently unbind the Part and expoſe it to the Air, to apply more of the warm Fomentation; but it is ſufficient, nay even preferable, to ſoak the Compreſſes well in the Fomentation, and to keep them hot upon the Parts by the forementioned Contrivance.

An obſtinate Gangrene, how to be treated.

IX. But the more obſtinate and nearer we find a Gangrene is to a *Sphacelus*, the more potent Remedies are we obliged to make uſe of. Such principally are the very numerous long and deep Inciſions and Scarifications of the Parts affected down to thoſe which are found. The Inciſions are alſo made not only longitudinally, but alſo tranſverſly, where they may be ſo with Safety, as in the Arm, Leg, and Thigh; by which means the Humours which lodge in the membranous Coverings of the Muſcles may be the better diſcharged, and the Tenſion of the Membranes taken off, and ſuch as ſtop the Motion of the Fluids by their Stricture will be relaxed. Afterwards the injured Parts are to be well rubbed and ſoaked with the ſtimulating, diſcutient, and balſamic Medicines at §. 7. then is to be applied a penetrating and diſcutient Cataplaſm, that the Blood in the vitiated Parts may be reſtored as much as poſſible to its free Motion. The following may ſerve for a Cataplaſm of this kind:

℞ *Herb. Scord. Malv. Abſinth. Matricar. ana* M ij. *Menth. Abroton. ana* M j. *Coquantur in ſ. q. Oxycrati, vaſe clauſo, ad conſiſtentiam Cataplaſmatis ſive Pultis, eique poſtea admiſce Salis Ammoniaci* ℥ ß. *Farin. Lin.* ℥ ij. *Ol. infuſ. Rut. vel Chamæmel.* ℥ ß. *M. f. Cataplaſma.*

Always before the Cataplaſm is applied to the Part, it ſhould be mixed with ſome *Sp. Vin. Camph. aut Theriac.* to encreaſe its Virtue; or, inſtead of this Cataplaſm, we may uſe the following recommended by the forecited KOENERDINGIUS[f].

[f] *In Libello de Gangrænâ ſupra citato.*

℞ *Mic.*

℞ *Mic. Pan. Alb.* ℔ j. *Pulv. Abſinth. Scord. Rutæ, ana* M j. *Vini q. ſ. ad conſiſt. Cataplaſmatis, poſt levem ebullitionem adde Sp. Vini* ℥ iv.

This is to be applied warm. In the mean time it is a neceſſary Caution to be obſerved in the Application of Fomentations and Cataplaſms, *viz.* that they ſhould not be renewed too often, but only two or three times in a Day; for Experience has taught us that the Humours may by that means be diſperſed and attenuated ſooner, and with more Eaſe, than by uncovering the affected Parts every Hour, as is cuſtomary [g]: But we muſt alſo carefully obſerve that Cataplaſms and Fomentations ſhould not only be as warm as poſſible, when they are firſt applied, but are alſo to be kept warm all the while upon the Parts, by covering them with hot Cloths, Tiles, or a Bag of Sand; by which means they will penetrate, ſtimulate, move, and attenuate much better; for if they become cold, they prove not only uſeleſs but very pernicious. All things well conſidered, we can hardly affirm that we have any thing that will cure a Gangrene or prevent a *Sphacelus*; but if the *Cortex Peruvianus* has the Effects attributed to it in this Diſeaſe, we need not be troubled with ſuch a Train of ineffectual Remedies, nor charge our Heads with ſo many irkſom Cautions and Obſervations thereon [h].

How a *Sphacelus* is to be treated.

X. But if the Parts are already become quite dead, ſo as to be entirely without Senſe, and ſoft, ſo as to retain the Impreſſions of one's Fingers Ends, and appear to be fetid and corrupted; in that Caſe, all the Medicines in the World will be inſufficient to reſtore the Parts to Life again: But there remains one, though a miſerable Remedy, to preſerve the reſt of the Body by amputating the dead Parts, that the Diſeaſe may not ſpread through the reſt which are ſound. But a different Courſe muſt be taken in this Amputation, according to the degree of Corruption, and the particular Nature of the Parts ſo affected. For if only ſome Extremity of the Foot, *Tarſus*, *Metatarſus*, Ancle, or Inſtep, or only the bare Skin and Fat are ſphacelated, the whole Member or Foot ought not in that Caſe to be amputated; but preſerving the Limb entire, we are to remove only that Part which we find vitiated, and that, in my Opinion, by means of Suppuration, as we taught in *Chap.* XI. §. 6, *ſeq.* of peſtilential Carbuncles, or elſe to be taken off by cauſtic Medicines. Thoſe who undertake the Cure of a *Sphacelus* by *Suppuration*, are to take two things chiefly into Conſideration: (1.) To effect the Suppuration as ſoon as poſſible; and then (2.) to remove the dead Cruſt or Eſchar of the Ulcer, and ſeparate it from the ſound Parts.

[g] GARENGEOT will have the Dreſſing not to be opened above once in the Space of four and twenty Hours, in this Diſeaſe, in his Operations, Chapter of a Gangrene. But becauſe the Parts affected may ſuffer great Alterations in that time, and as the Virtue of Medicines will ſcarce laſt ſo long, I think it more adviſeable for the Surgeon to inſpect the Parts two or three times in a Day, that he may renew the Medicines, know how it goes forward, and what is to be further done, and that he may prevent any bad Accident.

[h] I made trial of the *Cortex* lately upon a corpulent female Patient of near ſixty, who was afflicted with a Gangrene from an internal Cauſe, about the lower Part of the *Tibia*, *Tarſus*, and *Metatarſus*, wherein the common Integuments of the Body were already ſphacelated and corrupted; but ſhe always threw up the Remedy by Vomit, ſoon after every time ſhe took it, as ſhe had likewiſe done other Medicines for ſome time before; ſo that I was obliged to lay it aſide. But after many other things tried in vain, I at length reſtrained her vomiting by the *Pyrmont Waters* drank cold, (for ſhe threw them up when warm) and performed the reſt of the Cure by the Medicines hereafter recommended for the Cure of a *Sphacelus*. Whence it appears that all Gangrenes and *Sphaceli* from internal Cauſes are not incurable, as ſome Authors have aſſerted.

A Suppuration how to be promoted.

XI. To expedite and quicken the Suppuration, nothing equals the making long and deep Scarifications or Inciſions, eſpecially near the ſound Parts: For by making innumerable Inciſions ſo deep, till we find that we every way touch the ſenſible Parts, ſo as to excite Pain, the noxious Matter lodged under the Eſchars may thereby be more eaſily diſcharged, proper Medicines will more readily penetrate the Parts, and the dead Parts will by that means be more ſpeedily ſuppurated, and the ſooner ſeparate from the ſound. But the moſt efficacious Medicines to promote this Separation of the vitiated Parts from the ſound, are Emollients and Balſamics which reſiſt Putrifaction, uſed in the following Method, *viz.* the inciſed Parts are to be firſt well anointed with *Unguent. Digeſtivum*, and then to be carefully treated with the balſamic Cataplaſms and Fomentations. To this Place belongs the following Fomentation, beſides thoſe mentioned §. 7, 8, 9.

℞ *Decocti Hordei vel Scordii* ℔ j. *Acet. Rutac.* ℥vj. *Spir. Vin. Theriacal.* ℥ iv. *Sal. Marin. aut Vulgar.* ℥j. *vel* ℥ij. *Miſc.*

This is to be applied hot with Compreſſes to the inciſed Parts, and frequently repeated, till the Diſorder appears to ſpread no further. We know the *Sphacelus* ceaſes to ſpread, when the Tumor of the vitiated Parts ſubſides, and the Lips of the adjacent ſound Parts become tumid all round; and on the ſecond or third Day after, a Suppuration is gradually formed, and the ſound Parts ſeparate from the vitiated. But to ſoften and promote a ſpeedy Separation of the Eſchar afterwards, the following Cataplaſm will be found very ſerviceable:

℞ *Folior. Scordii M* ij. *Malvæ, Hyoſciam. Alth. ana M* j. *Flor. Lavendul. M* ß. *coquantur cum Aceto vel Oxycrato ad conſiſtentiam Cataplaſmatis, cui tandem admiſce Farin. Lin.* ℥ iij. *Ol. Lin.* ℥ j. *Sal. Ammoniac.* ℥ ij. *F. Cataplaſma.*

This is to be applied warm over the Whole, and it is to be retained in that Condition of Heat as long as requiſite, by the means before-mentioned at §. 7, 9.

The Separation and cleanſing of the Parts how to be effected.

XII. After theſe Medicines have been uſed, and when the whole ſurrounding Skin is gently tumified, with Redneſs, a Cruſt or Eſchar is formed by degrees, and the ſound Fleſh begins to ſeparate from the reſt; this is then a Sign that the Diſorder has done ſpreading, and that an entire Separation of the vitiated Parts will ſhortly follow: Therefore whenever this Separation ſhews itſelf, it ſhould be promoted as much as poſſible, by the Uſe of ſome ſuppurating Ointment, ſuch as is commonly termed digeſtive; which may be applied either alone or mixed with ſome *Theriaca*; to be retained on between the ſound and dead Parts (which may be ſometimes a little divided by the Lancet) after which the preceding Cataplaſm ſhould be applied: But in all future Dreſſings, whatever of the dead Parts is found looſe or ſeparated ſhould be removed every Day; or if any of the vitiated Parts ſhould in ſome meaſure adhere to the ſound, they may be ſeparated by the Sciſſors or Scalpel, without any great Pain or Danger. After this, it will be proper to remove the Cataplaſm, and apply ſome digeſtive Ointment or *Empl. Diachyl. vel Saturnin.* in the room thereof, till the corrupted Parts are entirely caſt off, and the Ulcer appears to be well cleanſed. The Separation of the corrupted Parts from the ſound, may be wonderfully promoted by keeping the diſordered Limb in a conſtant Warmth, by Cataplaſms covered with

with hot Bricks or Tiles, to retain the Heat and avoid the frequent uncovering of the Parts to apply freſh Cataplaſms. When the ſound Parts are ſufficiently deterged or cleanſed, we muſt then proceed to their Agglutination or Cure; in order to which we ſhall find great Benefit from *Ung. Digeſtiv. vel Baſilicum, vel Balſ. Arcæi*, together with the forementioned Plaſters.

Cauſtics, which and how to be applied.

XIII. But there are many Surgeons, who to avoid the Length of time which is uſually taken up in forming a Suppuration, and for ſome other Reaſons, have recourſe directly to *cauſtic Medicines* in this State of their Diſorder. Their Method of Treatment is this: They anoint the Lips only, or elſe the Whole of the corrupted Parts every Day with *Butyr. Antimon.* or *Lap. Cauſt. liquefact.* till the living Parts are ſurrounded by a ſort of Eſchar; and always afterwards they apply the forementioned (§. 9, *and* 11.) Fomentations and Cataplaſms; in order to prevent the Diſorder from ſpreading, and to make the corrupted Fleſh ſeparate from the ſound. To this Place belongs the *Aqua Phagedænica* and the *Lixivium rodens* BOERHAAVII *in Mater. Med.* §. 462.

℞ *Calc. viv. fortiſſ.* ℥ iij. *Ciner. Clavellator.* ℥ ix.

Theſe are to be firſt ground ſeparately, and to be afterwards mixed together, adding a little Water; then let them be put in a Glaſs, and ſtand in a moiſt Cellar to diſſolve: As ſoon as they are become fluid, filtrate through coarſe and ſpongy Paper, and then let the Liquor be preſerved for Uſe. When there is a Call to uſe it, let a Bruſh or Feather be dipped into it, and afterwards rubbed over the Part, once or twice in a Day, as you ſhall ſee Occaſion; or you may wet fine Linen Rags with this Liquor, and lay them upon the Part, not neglecting the Uſe of the emollient Cataplaſms at N°. VIII. or IX. at the ſame time: This Method of Dreſſing ſhould be continued till the Parts ſhall ſuppurate or fall off in Cruſts or Scales: If this Application has ſo far anſwered your Intention, you may proceed to cleanſe the Wound with Digeſtives, and afterwards heal with a vulnerary Balſam, as we juſt now directed above at N°. XII. But if any Miſchief ſhould remain underneath after you have healed, you muſt again have recourſe to corroſive Medicines, and as to the reſt proceed as we have directed above: The beſt Form of a corroſive Application that I have ſeen, is deſcribed by BELLOSTE in his *Hoſpital Surgeon*: He is not ſhort in commending it himſelf; he ſays, when you are furniſhed with this you may ſpare yourſelf the Trouble of ſearching for a better Remedy. The following is the Deſcription of it:

℞ *Spirit. Nitri vel Aquæ Fort. P.* ij. *Argenti Vivi P.* j. *m. f. lento calore Mercurii ſolutio.*

The mortified Part is to be wetted with this corroſive Liquor, which will occaſion a ſpeedy Separation of it from the ſound Parts.

Of the actual Cautery in this Caſe.

XIV. Several Phyſicians and Surgeons, particularly the famous BOERHAAVE, adviſe cauteriſing or dividing with the Knife down to the Bottom where it is ſound; and this Method they prefer to all others. But as this kind of Treatment carries great Cruelty with it, and cannot be performed without giving the Patient violent Pain, and is frequently attended with Danger, I cannot help preferring the Uſe of *Suppurants* or *mild* Corroſives, as a milder and ſafer Method of Cure: And indeed the Surgeons of the preſent Age in general, are not ſo

fond of calling for the actual Cautery as their Fathers were, especially where they can find Remedies of equal Efficacy.

Amputation when to be performed.

XV. Lastly, When the *Sphacelus* is so deeply fixed in any Part of the upper or lower Extremity, that it has penetrated through the Muscles as far as to the Bone, and has resisted all the Force of Medicines, or the proper time for applying them has been neglected; in this Case, for the Preservation of Life in the Parts that remain untouched, the injured Part must be separated from the Body with proper Instruments. We shall fully describe the Method of doing this in each particular Part of the Body, when we come to treat of *Chirurgical Operations*. In the mean time I cannot give the Surgeon a more seasonable Piece of Advice than this, that whenever he thinks the Amputation of a Part necessary, he cannot more effectually consult his own Reputation and his Patient's Safety, than by calling in a prudent *Physician* or two, that may confirm his Opinion of the Necessity of the Operation; and may give him their Assistance if any bad Accident should happen, such as Hæmorrhage, Faintings, Fever, and the like; which are very common Consequences of these great Operations. The Surgeon should also be very careful in keeping up the Strength of the Patient as much as possible, lest he should sink under the Discharge of Matter.

CHAP. XV.

Of BURNS *and* SCALDS.

A Burn, what.

I. I BELIEVE no one will be offended at our treating of *Burns* as a Species of Inflammation, since the Appearances as well as Consequences of both are exactly the same. Injuries that are received in any Part of the Body, either by Fire itself or by Instruments heated with Fire, we call a *Burn* or *Scald*. Therefore we do not reckon Fire alone as the Cause of Burns and Scalds; but any other Bodies whether solid and hot, as live Coals, Iron or other Metal, red hot or melted, Gunpowder, or boiling Liquors, as Water, Beer, Wine, Oil, *&c.* are all to be reckoned under this Head.

The Nature of a Burn or Scald.

II. When any thing of this kind is applied to the Body, the Fibres and small Vessels of the Parts that are touched by it, will instantly corrugate and burst, whilst the Blood and other contained Fluids will be extravasated, stagnate, and corrupt. The Burns that we receive from solid Bodies are always attended with more grievous Consequences than those which are occasioned by boiling Liquors, (which we call *Scalding*) therefore there are different Degrees of this Injury, as there are of Inflammation.

Four Degrees of Burns.

III. We may very fairly therefore divide Burns or Scalds into four Degrees: The *first*, and slightest, is that which occasions Heat, Pain, and a small Vesication on the injured Part, in a short time. The *second* Degree is, when the Part is instantly affected with great Pain and Vesication. The *third* is, when the common Integuments and subjacent Flesh are so burnt that they form a Crust. The *fourth* and last, is where every thing is destroyed quite down to the Bone. The third Species is nearly allied to the Gangrene, and the fourth to a *Sphacelus*. This illustrates the near relation between Burns and Inflammations.

IV. By

IV. By conſidering the Degree of the Burn, and the Uſe and Conſequence of the Part burnt, you may prognoſticate in what manner the Injury will terminate: A ſmall Veſication raiſed in the Hand by the Fire, is leſs to be dreaded than a ſlighter Burn upon the Eye; for that very tender and uſeful Part of the Body can ſcarce receive any Injury by Fire, without endangering the Loſs of Sight: We ſhould alſo conſider the Extent of the Burn, what Length of Time it has been upon the Part, before we can form a true Judgment of the Conſequences that will attend it; for the Danger will be greatly increaſed by the Length of Time that the Part has been injured, and in proportion to the Degree to which the Injury has ſpread itſelf; for where the whole Surface of the Body is burnt with Gunpowder, or ſcalded with any boiling Liquor, though the Injury conſidered in any particular Part ſhall be looked upon as a very ſlight one, yet by being ſpread to ſo great an Extent, it is a Diſorder of the laſt Conſequence: In this Caſe it is impoſſible for the Patient to lay down or change his Poſture without horrid Pain and Torture, which will prevent his Sleep, encreaſe his Fever, and by degrees bring on a *Sphacelus*, and Death itſelf; and this is the Caſe more particularly in Infants, ſince they have leſs Strength and Patience than Adults, and want Reaſon to diſcover which would be the moſt convenient Situation for them. The Danger of the Burn will be increaſed in proportion to the Depth to which it has penetrated. Burns of the Face are not only to be dreaded for the Deformity which they occaſion, but chiefly for the Inconveniences that they may produce by cauſing the Eyelids to grow together. Deep Burns of the Neck, if not timely remedied, occaſion a Wryneſs of that Part. You will eaſily be able to foretel what Danger or Inconvenience will ariſe from Burns of any other Part, if you diligently conſider what we have here ſaid, and are well skilled in the natural Uſe of the injured Parts. *Prognoſis.*

V. As we obſerved above, that Burns nearly reſembled inflammatory Diſorders in their Degrees, ſo do they in the Method of Cure. In the ſlighteſt or firſt Degree of a Burn, the Intention is to diſperſe it by the Remedies which we adviſed for a *Phlegmon*, (*Chap.* II. §. 9.) of theſe there are two Sorts, *Aſtringents and Emollients*: The beſt ſlight Aſtringent is, *Spiritus Vini vel Vulgaris bonæ notæ, vel rectificatus vel & camphoratus.* This may be applied to the Part with Linen Rags; with the ſame Intention alſo you may order *Acetum Lithargyriſatum, Muria Braſſicæ conditæ, vel & Oxycratum cum Sale decoctum calidúmque*: Theſe may be applied in the ſame manner with the foregoing, and ſhould be repeated as you ſhall ſee Occaſion. *Oleum Terebinthinæ* has very good Effects in this Caſe, if you apply it in time, and repeat it frequently. The vulgar Method of applying the burnt Part to a Candle or the Fire, and keeping it in that Poſition as long as you can bear it, repeating this Proceſs till all Senſe of Heat and Pain is entirely removed, is frequently attempted with Succeſs, where the Injury is in one of the Fingers, or on the Hand; for the ſtagnating Fluids are by the Force of the Fire driven back into their proper Channels, and by this means the Veſication and other troubleſome Symptoms, which uſually ſucceed, are happily prevented. From hence it appears that the firſt Degree of Burns is eaſily remedied. *Cure of the firſt Degree by diſperſing Remedies.*

VI. There is another Method of Cure, which is equally efficacious with the former, though it is founded upon a contrary Intention: This is by *emollient Remedies* which remove the Tenſion of the Fibres and Veſſels, and reſtore the Blood *By Emollients.*

Blood to its natural Courſe, before any bad Symptoms come on. The injured Part may be fomented with Water, as hot as the Patient can bear it, till the Pain and Heat entirely diſappear. SYDENHAM highly recommends this Practice, and, in my Opinion, with great Juſtice. But this Fomentation will be improved if you boil ſome emollient Ingredients in the Water, as *Althæa*, *Malvæ*, *Verbaſcum*, *Sem. Lini*, *Fænum Græc.* *Mali Cydonii Semina*, or others of this Intention. But emollient Cataplaſms are of the higheſt Service in this Caſe, made of any of the abovementioned Ingredients for a Decoction, and frequently laid on upon the affected Part as warm as they can be endured. Emollient Oils alſo have their Uſe in forwarding this Intention, as *Oleum Lini*, *Amygdalarum dulcium*, *Olivarum*, *Liliorum alborum*, *Hyoſciami*, and the like: Theſe Oils are to be uſed either by dipping Rags into them, and applying them to the burnt Parts; or they may be laid on frequently with Feathers as faſt as they begin to dry away. We muſt not omit in this Place to mention a famous Liniment of MYNWETTUS, which he calls his *Unguentum ad Ambuſtiones*; this is compoſed *ex Oleo Lini vel Olivarum cum Albumine Ovi mixto*, and applied as the Oils above. *Mali Cydonii Mucilago* is properly enough preſcribed in this Caſe. The Remedies which we have here recommended give Relief, by being frequently repeated; therefore when the Face is burnt, they ſhould be ſpread upon a Linen Mask, which you muſt keep continually moiſt by freſh Applications of the Remedy. (*See Plate* XXII.) Where the Neck is burnt, to prevent it from contracting, you muſt have recourſe to a particular kind of Bandage, which you will find deſcribed below, when I come to treat of Bandages.

Cure of the ſecond Degree.

VII. When the Burn is of the ſecond Degree, which I have deſcribed above, attended with Veſication or Puſtules, I would by no means adviſe opening the Veſications, or ſcarifying the lacerated *Cutis*, becauſe this Practice brings on very ſharp Pains. You will always find it more adviſeable to apply one of the Remedies preſcribed above, take which you pleaſe, the neareſt at hand, ſuppoſe warm Water, burnt Wine, or Spirits of Wine, and renew the Application of it frequently: By this means you will find the Heat and Pain quickly go off, and the Cuticle will ſeparate from the *Cutis*, without leaving any Deformity. But if, notwithſtanding the repeated Applications of theſe Remedies, ſome Pain ſhall ſtill remain, dreſs the Part with Emollients: The moſt eligible of theſe are *Oleum Lini*, *Unguentum ad Ambuſtionem* MYNSICHTI, *vel Nutritum*, *de Lithargyrio*, *vel Diapompholygos*; theſe ſhould be either rubbed into the Part frequently, or ſpread upon a Linen Rag, and applied to it. After the Heat and Pain are removed by theſe Applications, lay on the *Empl. ad Ambuſta*, *vel de Minio*, which will keep the Skin ſmooth, and forward the Renovation of the Cuticle. If the Injury is very conſiderable as to its Extent, and great Part of the Body is ſcalded or burnt, it will be neceſſary to open a Vein and bleed plentifully, even *ad animi deliquium*, and afterwards you ſhould preſcribe a brisk Purge, of the ſame kind which we directed for Contuſion. (*Book* I. *Chap* XV. §. 13.) This Method may poſſibly prevent ill Conſequences which uſually attend Burns of large Extent, ſuch as foul Ulcers, large Cicatrixes, and Gangrene itſelf. The ſame external Dreſſings are to be applied in this Caſe which we adviſed above. When *Infants* are the Subjects of this Diſorder, their tender Age prevents us from bleeding plentifully, therefore the Revulſion muſt be made by repeated Purging. That ſtrict Regularity in Diet which we enjoined above in treating

of

of Wounds and Inflammations, is never more requiſite to be obſerved than in this Caſe: All Intemperance is of the laſt Conſequence, as it encreaſes the Fever and Pain. According to the Opinion of the famous DIGBY, nothing takes off the Heat ſooner than *Spiritus Salis* given from *Guttæ* x. to xv. in any Liquor, and repeated at Diſcretion. Theſe Methods being timely and diligently proſecuted, heal and reſtore the burnt Parts of the Body in a moſt wonderful manner.

VIII. In the third Degree of Burns, where the injured Part is covered with a Cruſt or Eſchar, the Cure cannot be performed without Suppuration. When this happens in the Face, we ſhould uſe all our Attention to prevent Deformity, which may be occaſioned by a large Cicatrix. Therefore in this Caſe the Uſe of all Plaſters and Ointments whatſoever is to be avoided, even though they ſhould be eſteemed as valuable Secrets, and highly commended for their Virtue in curing Burns and Scalds: For the Miſchief of theſe kinds of Remedies is, that they dry up the Wound too faſt, and at the ſame time contract the Fibres and the Skin, and by that means leave a very unequal Cicatrix. For the ſame Reaſon you cannot be too ſollicitous in forwarding the caſting off of the Eſchar and the Evacuation of the Matter that is concealed under. But to diſcover the happieſt Means of performing theſe Intentions, *hoc opus, hic labor eſt.* They who attempt this by tearing away the Eſchar with their Hands, or endeavour to ſeparate it with the Knife, by no means conſult the Good of their Patients. The eaſieſt and moſt ſucceſsful Method, in my Opinion, is by the Uſe of Emollients: Any of the Emollients we mentioned above may be applied warm, and repeated till the hard Cruſt ſeparates from the live Fleſh. The Part ſhould be dreſſed two or three times in a Day, and at each Dreſſing, if you ſhould obſerve any Portion of the Cruſt tending to a Separation from the reſt, you ſhould remove it with your *Forceps*, and anoint the remaining Cruſt with Butter, at the ſame time being never neglectful of the Uſe of Fomentations. This Method ſometimes takes up two, ſometimes three, ſometimes four Days before it performs its Office. The Cruſt being now entirely caſt off, our next Intention is to cleanſe and heal the Wound: The firſt of theſe Offices may be very well executed by any mild digeſtive Ointment, mixed up with *Mel Roſarum*; the Medicines uſed for healing the Wound are principally *Unguentum Diapompholygos, vel de Lithargyrio, necnon Emplaſtrum ad Ambuſta.* But if any Portion of the Eſchar is left under theſe Ointments and Plaſters, Experience ſufficiently teſtifies the Danger that will follow, of making a deformed Cicatrix, from the Conſtruction of the neighbouring Parts, and from the Acrimony of the confined *Sanies.* Whoever proſecutes this Method of Cure ſhould always obſerve, that if the Eſchar does not ſeparate in two or three Days, it will be neceſſary for him to make a deep Inciſion into it, that the *Sanies* may have room to diſcharge itſelf, (as we adviſed in the Caſe of Gangrenes, *Chap.* XIV. §. 7.) and then the Fomentations abovementioned are to be diligently applied, the Evacuations by Bleeding and Purging being always premiſed. Proper Regulations with regard to Diet are never more neceſſary to be complied with, than in this Caſe. The beſt Method of encouraging the Renovation of the Skin, is by frequently holding the burnt Part over the Steam that riſes from boiling Water; where the Part skins over very ſlowly, it may be proper to dreſs the Part with a Cerate made *ex Cerâ & Ovorum Oleo.*

Cure of the third Degree.

IX. But

Cure of the fourth Degree.

IX. But what is to be done in the fourth Degree, which we have deſcribed, which is always attended with extreme Danger? For when the Burn has penetrated ſo deep as to deſtroy all the Parts, quite down to the Bone, Medicine can take no place: Therefore there remains but one Remedy, and that a dreadful one, to wit, to amputate the injured Limb, that the ſound Parts may be ſaved, as we adviſed above in treating of a *Sphacelus*, (*Chap.* XIV. §. 14.)

CHAP. XVI.

Of a SCIRRHUS.

A *Scirrhus* what.

I. WE have already taught, that the fourth manner in which an Inflammation terminates is a *Scirrhus*; we uſually call a hard Tumor of any Part of the Body, that is void of Pain, a *Scirrhus*: This almoſt always ariſes from the Inſpiſſation and Induration of the Fluids contained in a Gland; though it may appear in other Parts, particularly in the Fat.

Seat of a *Scirrhus*.

II. The Seat of a *Scirrhus* is very various, for this Diſorder is not confined to the internal Parts alone, to wit, to the Liver, Spleen, Lungs, Meſentery, Pancreas, and in Females to the *Uterus*; but it frequently happens alſo to the external Parts, as to the Lips, Tongue, Tonſils, *Fauces*, Palate, Gums, Neck, *Mammæ*, *Axillæ*, *Inguina*, *Penis*, and Teſticles; and that generally after a previous Inflammation of any of thoſe Parts. A *Scirrhus* ſometimes appears without any previous Inflammation, eſpecially in Subjects of a heavy, phlegmatic, melancholic Habit of Body (to ſpeak according to the vulgar Phraſe.) Sometimes it is occaſioned by an external Injury, as by a Fall or Blow, *&c.* it is no difficult matter to determine the principal Cauſe of the Diſorder.

Effects of a *Scirrhus*.

III. As ſoon as a *Scirrhus* is formed, it is an immediate Conſequence that not only the indurated Part becomes unfit to perform the Functions allotted it by Nature, but the neighbouring Parts alſo will ſuffer Preſſure, and be impeded in the Performance of their Offices: Therefore it ought to appear no wonder that the neighbouring Parts ſhould be ſubject to Inflammations, Exulcerations, Cancer, Gangrene, *Tabes*, Stiffneſs, or Immobility, or the like, according to the Nature of the injured Part.

Signs.

IV. You will be at no great Difficulty in determining the Caſe to be a *Scirrhus*, when you diſcover a hard Tumor, on the external Parts (more particularly in thoſe Parts where the Glands are moſt frequent) and the Tumor is entirely free from Heat, Redneſs, and Pain. As I am ſpeaking to *Surgeons*, I only treat of external *Scirrhi*, for thoſe which are ſituated in the internal Parts fall very juſtly under the Province of the *Phyſician*.

Prognoſtic.

V. In order to form a proper Prognoſtic of this Diſorder, ſeveral things are to be obſerved; as, (1.) The more inveterate the *Scirrhus* is, ſo much the more dangerous will it be, and more difficult of Cure. (2.) A *Scirrhus* happening to young Perſons, and to thoſe of a firm Habit of Body, is much more ſafe and tractable than when it falls upon Perſons advanced in Years; particularly where Children have indurated Glands in the Neck, but are in all other reſpects in perfect Health, they are ſeldom attended with any Miſchief, and you uſually

uſually find they outgrow it; but in Valetudinarians, or where you have reaſon to ſuſpect the Pox to be at the bottom, the Caſe is far otherwiſe. (3.) A *Scirrhus* is of more or leſs Conſequence in Proportion to the Conſequence of the Part it falls uppon, in performing the neceſſary or noble Offices of Life: For this reaſon internal *Scirrhi* are always more dangerous than thoſe which happen upon the external Parts. Laſtly, (4.) The greater Miſchiefs the *Scirrhus* brings on, by ſo much the more grievous will it be; for as long as it lays quiet, and produces no Pain, ſo long will it remain without Danger; but as ſoon as it becomes painful or is ulcerated, it generally threatens an approaching *Cancer*. It may be proper to inform you in general, that the Cure of *Scirrhi* by Medicine is uſually attended with the greateſt Difficulty; therefore you ſhould never flatter your Patients with the Promiſe of certain Relief. But ſometimes they do admit of a Cure with the Knife or with Corroſives, eſpecially in younger Subjects that are otherwiſe of a good Habit of Body.

Method of Cure.

VI. When the *Scirrhus* is of long ſtanding, and the Patient infirm, it is far better to abſtain entirely from any Attempt to cure it, than to pretend to bring it to Digeſtion; for in this Caſe it is much to be feared, eſpecially in the Breaſts of Women, that whilſt you are proſecuting your Intention, the diſeaſed Part may ſhew its bad Diſpoſition, and become apparently cancerous: On the other hand, where the *Scirrhus* is but newly formed, and you have no Signs of vehement Pain or Hardneſs, where your Patient is otherwiſe of a ſound Habit of Body, I ſee no Reaſon why you ſhould not uſe both external and internal Remedies, to ſet the confined Fluids at Liberty. The internal Remedies, which are found principally ſerviceable in anſwering this Intention, are the Decoctions of the Woods, digeſtive Tinctures or Eſſences, and mild Mercurials, giving between whiles relaxing Medicines, to reſolve the thick inſpiſſated Humours. It is very dangerous to truſt to the uſe of external Remedies alone, therefore a prudent Phyſician ſhould always be conſulted in this Caſe, who may not only preſcribe proper internal Remedies, but direct the Patient alſo what ſort of Regimen will be moſt uſeful for him to obſerve, with regard to his Diet.

Diſperſing by (1.) Plaſters.

VII. With regard to external Reſolvents, *Plaſters* claim the firſt place, ſuch I mean as are made of the warm Gums, as *Gum. Ammoniac. Galban. Opopan. Sagapen. Bdell. &c.* which may be applied alone or mixed together; ſometimes with the Addition of *Radix Bryoniæ, atque Ariſtolochiæ rotundæ* finely powdered: Of the ſame Intention are *Empl. de Galbano, de Gum. Ammoniaco, de Cicutâ, de Ranis* VIGONII *vel Diachylon cum Mercurio*; or the following:

℞ *Gumm. Galban. Opopanac. ana* ℥j. *Ammoniac. Bdell. ana* ℥ij. *Ol. Olivar.* ℥ij. *Ceræ Citrin.* ℥ß. *Pulv. Ariſtoloch. Long. Ver. Rotund. Ver. Lapid. Calaminar. Myrrh. Thur. ana* ℥j. *Terebinthin. Venet.* ℥iij. *m. f. ſ. a. Emplaſtrum.*

(2.) By Cataplaſms.

VIII. The next place to Plaſters is held by *Cataplaſms*, amongſt the principal of which may be reckoned the following:

℞ *Rad. Bryon. alb.* ℥iiij. *Ariſtoloch. rotund. Angelic. ana* ℥j. *Herb. Sabin. Rut. Scord. Abſinth. Flor. Chamæmel. ana M*j. *Melilot. Sambuc. Althææ, Centaur. minor. ana M*ß *coq. cum q. ſ. Aquæ ſimplic. ad conſiſtentiam Cataplaſmat. vaſe clauſo, ſub finem addendo Galban. (Vitell. Ov. q. ſ. ſolut.)* ℥iij. *Farin. Lini* ℥ij. *Ol. Lini q. ſ. f. Cataplaſma.*

This Cataplaſm, or, if you rather chuſe it, a Fomentation made of the ſame Herbs boiled in Vinegar, is to be applied warm, and repeated as you ſhall ſee occaſion, not neglecting at the ſame time the uſe of internal Remedies.

(3.) By acid Vapours.

IX. Some highly recommend acid Vapours in this Caſe: Sometimes it has been found ſerviceable to receive the Steam of boiling Vinegar upon the diſeaſed Part, either of common Vinegar, or of that made with Lavender, Alder, Rue, or *Theriaca*. Some ſprinkle the Vinegar upon a hot Stone, and receive the Steam through a Funnel: Others ſet *Sulphur* on fire, and hold the Part over the Fume: Others again are fond of Fumigations of *Cinnabar*. Great Care muſt be taken in this Caſe not to raiſe too large a Fume, nor to repeat it too frequently, and the Patient muſt be cautioned not to admit it at the Noſe or Mouth: For it can ſcarce be ſaid how injurious theſe Steams are to the Lungs, and the Quantity of Mercury contained in Cinnabar, makes it very apt to raiſe a Salivation.

(4.) By Mercurials.

X. Mercurial Medicines perform Wonders in this Caſe, either adminiſtered in the Beginning, or after other Remedies have failed: Beſides giving Mercurials internally, you may make an excellent Ointment, *ex Hydrargyro cum Adipe Suillâ, necnon modico Terebinthinæ quantum ad eum ſubigendum ſufficit, admixtis in Mortario vitreo vel lapideo.* The *Scirrhus* ſhould be anointed twice or thrice a Day with this, covering it with the *Emplaſtrum Vigonis cum Mercurio*; but to prevent this Method from raiſing a Salivation, it will be neceſſary to preſcribe an opening Medicine every fourth or fifth Day, ſuch as *Rad. Jalap. præp.* or *Extract. Rud.* in ſmall Doſes. Whilſt the Patient is in this Courſe, his Jaws ſhould be very diligently inſpected, and if you find the Glands enlarge and grow painful, you muſt entirely omit the uſe of Mercurials, and repeat your purging Medicines, till all theſe Symptoms of an approaching Ptyaliſm entirely diſappear; by obſerving theſe Cautions, you may have very good Reaſon to promiſe yourſelf Succeſs, where you are called in time, before the Caſe is become deſperate.

(1.) By the Knife.

XI. If all the above mentioned Remedies prove unſucceſsful, if the *Scirrhus* is free and moveable, and its Situation threatens no great Danger from the neighbourhood of conſiderable Veſſels, if you ſhall judge the Strength of the Patient to be ſufficient to undergo the Operation, you may very fairly call the Knife in aid, to prevent the Caſe becoming cancerous (which too often happens.) When you have taken out the *Scirrhus*, dreſs the Wound with *Linimentum Arcæi*, or any other vulnerary Medicine, and heal as we have directed in other Wounds.

When the Caſe is entirely to be let alone.

XII. Where the *Scirrhus* is fixed, knotty, uneven, and deeply rooted; where the Patient is of a bad Habit of Body, is ſubject to form *Scirrhus*'s from ſome hereditary Taint, or perhaps has formed ſeveral already. Laſtly, where the Situation of the Diſorder is ſuch, that from the Vicinity of conſiderable Veins and Arteries you are in apparent Danger of bringing on an Hæmorrhage which may prove fatal, then all Attempts to cure, whether by the Knife, or by digeſtive or corroſive Applications, are to be neglected: For this kind of *Scirrhus* is almoſt conſtantly attended with very ſharp Pains, and often degenerates into a *Cancer*; in this Caſe therefore the Pains are to be aſſwaged if poſſible, and the Cancer to be prevented.

Internal Medicines to prevent a Cancer.

XIII. When you are under Apprehenſions of an approaching Cancer, your Buſineſs is not only to attempt to correct the Acrimony of the Blood, by the uſe

of

of both internal as well as external Remedies, but a ſtrict Regimen with regard to Diet, muſt alſo be moſt religiouſly enjoined. Conſtitutions of this ſort are much mended by the uſe of Broths and Soops of various kinds, made from the Fleſh of younger Animals, with the addition ſometimes of a few Pot Herbs, *ſc. Hordeum, Avena, Oryza, Millium, Spinachia, Aſparagus, Scorzonera, &c.* The moſt wholſom common Drink in this Caſe is either fair Water, or a Ptiſan made *ex Decocto Radicis Chinæ, Sarſaparill. Gramin. Polypod. Veronicæ, Linguæ Cervinæ, Agrimon. Solidaginis Saraſenicæ, Herb. Parietar. Capillor. Veneris*, and others of this kind. When the *Scirrhus* is attended with violent Pains, you may add to the Materials of your Decoction, *Sem. Papaver. albi*, and if the Patient has no Objection to it, you may ſweeten it *cum Syrupo Papaver. albi.* It will be very proper alſo at this time to correct the Acrimony of the Blood by giving two or three times every Day, a Doſe *e Pulv. Lap. Cancr. Sale Abſinthii, Cinnabari Nativâ, Antimonio Crudo, Antimonio Diaphoretico*, adding to each Doſe, as you ſhall ſee occaſion, *Laudani Opiati gr.* ß. to aſſwage the Vehemence of the Pain. Wonders are alſo effected in this Caſe by the *Pulvis Succúſve recens ex Millepedibus, Sperma Ceti ad* ʒj. to be given with any of the foregoing Powders; by Purges even of the Mercurial kind, and by bleeding and cupping frequently in Spring and Autumn.

External Applications.

XIV. A thin Plate of Lead, well impregnated with Quickſilver, may very conveniently be faſtened on the Part, and worn there conſtantly with ſome Benefit: For this Method frequently leſſens the Senſe of Heat and Pain, not to ſay that it frequently prevents the Cancer. But if the Application of a Plate of Lead ſhall ſeem to be unequal to the Intention for which it was deſigned, then you may apply Plaſters and Ointments compoſed of ſuch Ingredients as are moſt likely to aſſwage the Pains; of this kind are the following:

℞ *Unguenti Diapompholygos* ʒij. *Opii puri* ℈ß. *m. f. Ung. quocum pars affecta ſæpius inungatur. Vel,*

℞ *Amalgam. Mercur. & Plumbi* ʒj. *Unguenti Roſati q. ſ. m. f. Unguentum cum Linteo inſtar Emplaſtri applicandum. Vel,*

℞ *Aceti Lithargyriſat.* ʒj. *Olei expreſſ. Sem. Hyoſciam. Papav. alb. Olei infuſ. Roſar. ana* ʒij. *m. f. ſ. a. Nutritum, cui ſub finem add. Opii puri gr.* vj. *ad* x. *quod linteolis illitum aliquoties quotidie ſuper Scirrhum applicetur.*

If your Patient diſlikes the Application of theſe Ointments, and prefers a neater Application, you may ſubſtitute refrigerant Plaſters in their Room, ſuch as *Emplaſtrum Saturninum* MYNSICHT. *de Minio, Diapompholygos*; or laſtly that excellent Plaſter for alleviating Pain, which is preſcribed in the following manner:

℞ *Succ. recent. expreſſ. & purificat. Fol. Hyoſciam. Papav. Hortenſ. Phellandi ana* ʒiv. *coquendo leni igne inſpiſſa, ſub finem add. Ceræ alb.* ʒviij. *Ol. infuſ. Roſar.* ʒj. *m. f. Emplaſtrum. Vel,*

℞ *Sacch. Saturn. Ceraſſ. Amalgam. Mercurii & Saturni, Ol. expreſſ. Hyoſciam. infuſ. Roſar. ana* ʒij. *m. f. Emplaſtrum.*

If the Pains are very violent, you may add a diſcretional Quantity of *Opium* to either of theſe Plaſters, and apply it to the Part.

What is to be concluded concerning Suppurants, Corroſives, and the actual Cautery.

XV. Notwithſtanding many Phyſicians and Surgeons of Eminence at this time recommend the uſe of *Suppurants*, *Corroſives*, and even the *actual Cautery* for the Cure of ſcirrhous Tumors, yet I cannot help being of Opinion, that the Danger of a Cancer enſuing from the uſe of Suppurants or Corroſives, and the natural Dread that moſt People are ſtruck with at the ſight of a red hot Iron, beſides innumerable other Inconveniences, ought to diſſwade us from attempting ſuch ſlow, hazardous, and cruel Methods of Cure. For this Reaſon it will appear, that the ſafeſt and readieſt Method of deſtroying a large or painful *Scirrhus*, is to cut the indurated Part entirely out, whether it be ſituated on the Lips, Salivary Glands, *Mammæ*, or Teſticles, provided you run no riſque of a mortal Hæmorrhage, (§. 11, 12.) If you leave any Part of it behind, there is great Danger that it may lay a Foundation for a Cancer; nay, what is hardeſt of all, though the *Scirrhus* be entirely rooted out, it frequently happens that another ſprings up without any Fault to be laid to the Surgeon. I can by no means approve of the Practice of ſome Phyſicians, who order the bottom of the Wound to be cauterized, to prevent any return of the *Scirrhus*, and to take off the Hæmorrhage: In this they are doing nothing, [a] ſince it is of very little Conſequence in preventing the return of the Diſorder, and there are many milder and ſafer Remedies at hand to ſtop the Hæmorrhage; therefore, when you have finiſhed your Operation, dreſs as in other Wounds.

CHAP. XVII.

Of a CANCER.

A Cancer, what.

I. WHEN a *Scirrhus* can neither be diſperſed, ſoftened, or taken out with the Knife, whether it be occaſioned by the Vehemence of the Diſeaſe, or the Ignorance and Maltreatment of the Surgeon, the Patient will complain of pricking Pains in the Part, and the Tumor will ſpread itſelf unequally. This malignant and worſt State of a *Scirrhus* was called formerly *Carcinoma*, by us a *Cancer*: For the Veins about the Part are diſtended, and form Incurvations, which, ſome imagine, bear a reſemblance to a Crab's Claws. As long as the Tumor is entirely covered with Skin, it is called an *occult Cancer*; but when the Skin breaks and is ulcerated, it is termed by the Phyſicians an *ulcerated Cancer*.

Beginning and Increaſe of the Diſeaſe.

II. The Beginning and Increaſe of the Diſeaſe afford pretty near the following Appearances: At firſt there appears a very ſmall Tumor, which ſometimes maintains the ſame Size for a conſiderable time, without any apparent Increaſe; on a ſudden it enlarges beyond all Conception: At firſt it is attended with little or no Pain; upon the Increaſe of the Tumor the Pain becomes intolerable, ſometimes ſo violent as not to be borne without Fainting: If you apply repelling or aſtringent Remedies to the Part, the Diſorder encreaſes wonderfully; inſomuch that one Month will produce more Increaſe of Pain and Tumor, than a Year without any medicinal Applications. The uſe of Medicine will ſo far ir-

[a] This was obſerved in the moſt ancient times. See CELSUS *Book* V. *Chap.* XXVII. §. 2.

ritate

ritate this Diſorder, that the Skin will preſently break, and form a foul ſtinking Ulcer.

III. A Cancer as well as a *Scirrhus* will ariſe in almoſt any Part of the Body; but moſt frequently in the Breaſts of Women, nay ſometimes of Men; a very memorable Inſtance of which you will find recorded by BIDLOO. But beſides the Breaſts, the Lips alſo, the Gums, *Fauces*, Tongue, Noſe, and even the Parts of Generation are ſometimes the Seat of a Cancer. Seat of a Cancer.

IV. The Cauſes of a *Scirrhus* and *Cancer* are common to both, only theſe ſeem to have acquired ſome additional Acrimony. The malignant *Stimuli* of a Cancer are not only produced by the Application of lenient, acrimonious, or cauſtic Medicines, but they are alſo occaſioned by ſundry other Cauſes: That Sort of Diet is moſt miſchievous which is moſt apt to produce Acrimony in the Blood; therefore all Perſons that are by Habit of Body obnoxious to Diſorders of this kind, ſhould religiouſly abſtain from Lard and Pork Meats; Grief and Trouble of Mind are very apt to create a cancerous Diſpoſition of Body: It is obſervable that old Maids and even married Women that do not breed, are very ſubject to Cancers in the Breaſt; this generally happens to them when they are turned of forty Years of Age, at the Time when the menſtrual or hæmorrhoidal Diſcharge begins to decreaſe or diſappear; though I have frequently known this Caſe happen to Perſons not ſo far advanced in Years, even between twenty and thirty. Cauſes.

V. The Signs of an *occult Cancer* are as follow: The Patient perceives an Itching, Heat, or pricking Pain, in or about the *Scirrhus*; the neighbouring Parts grow livid; the Tumor has an unequal Surface, encreaſes in Size, and grows conſiderably harder than before; the Veins enlarge and become livid, though this Circumſtance does not always happen. If the Caſe is an *ulcerated Cancer*, you will diſcover it not only by the Ulceration of the Part, by an occult Cancer having preceded it; but the following Symptoms will make it evident to Demonſtration: *Diagnoſis.*

VI. A thin *Sanies* flows from the Ulcer in great Quantities; ſometimes ſo corroſive and acrimonious, that the Dreſſings ſeem as rotten as if they had been eaten by *Aqua Fortis*. The Stench is intolerable, eſpecially to thoſe who are not accuſtomed to it, and fills the whole Chamber; the Diſorder continues to ſpread itſelf wider, the Lips of the Ulcer enlarge, are wonderfully diſtorted and turned in; are ſometimes pale, ſometimes red, purple, green, livid, black, or variegated. Pains attended with a Senſation of burning, pricking, gnawing, come on at times with ſuch Vehemence, that through Anguiſh and want of Sleep the Patients are driven to almoſt Diſtraction and Deſpair, which greatly waſtes their Strength; their Appetite and Senſe of Smelling entirely fail them, till at laſt Death delivers them from a miſerable ſtinking Carcaſe: The Urgency of the Symptoms which we have recounted, depends upon the Patient's Habit of Body, and upon the Situation of the Part affected. Symptoms.

VII. An occult Cancer, which is not attended with any conſiderable degree of Pain, may be endured for a conſiderable length of time, without any great Inconvenience, by a Perſon endued with Strength and Temperance: But theſe very ſame Perſons, by an Irregularity in Diet, or medical Application, will be ſubject to the ſame grievous Symptoms which we have juſt enumerated. Notwithſtanding what has been ſaid, many have imprudently boaſted that they have *Prognoſis.*

have been poſſeſſed of infallible Secrets for the Cure of Cancers; though at the ſame time it muſt be confeſſed with [a] HILDANUS, and other capital Phyſicians, who confirm the Opinion of [b] HIPPOCRATES, and [c] CELSUS, that no Phyſician has yet been happy enough to diſcover a Medicine from which he could promiſe any certainty of Cure in this Caſe. We have a very memorable [d] Example of this in ANNE of AUSTRIA, Mother to LOUIS XIV, late King of *France*, who laboured under a cancerous Breaſt, and was not only attended by the Court Phyſicians, but by almoſt every one in that Kingdom, who had any Pretenſions to the Practice either of Phyſic or Surgery, particularly by thoſe that boaſted of their ſecret Art in curing Cancers: But notwithſtanding all the Attempts of Art, which the Deſire of gaining a Royal Reward could excite, no Help could be obtained for her; from which we may very fairly conclude, that there is no Help to be expected from any thing but the Knife. The Hopes we may entertain from Extirpation, depend upon the Degree of the Diſorder, the Urgency of the Symptoms, and the Strength and Habit of the Patient. When you ſhall be of Opinion that the Cancer is ſo deeply rooted that it will be impoſſible to extirpate it entirely, it is far better to lay aſide the Operation, than to torment a miſerable Perſon without any Hopes of relieving him. For Inſtance, when this Caſe falls upon the *Uterus*, *Fauces*, *Uvula*, *Tonſils*, *Axillæ*, and *Inguina*, it is ſcarcely ever curable; but Cancers of the Lips, *Palpebræ*, and *Mammæ*, are extirpated with Safety, and ſometimes admit of Cure; but there is great Danger of their returning. Some believe a Cancer to be contagious, though I could never obſerve any Foundation for this Opinion, though I have been pretty converſant in theſe Caſes.

KORTHOLTUS's Remedy for a Cancer.

IX. In *Ephemerid. Breſlavienſ. Phyſico-Medicis*, which were ſome time ſince publiſhed in *High Dutch*, in ſeveral Volumes, and alſo *in Praxi Medicâ* NENTERI, you will find great Recommendations of a *Naſtrum* of KORTHOLTUS's which is corroſive and emetic; but I muſt tell you at the ſame time, that I am informed by Men of the greateſt Credit, that it is of no Efficacy in the true Cancer.

When a Cancer is incurable.

X. When a Cancer yields to no Medicine, when it happens in old Age, or to a bad Habit of Body; when it is ſituated under the *Axillæ*, or near large Blood Veſſels, or has ſpread itſelf to a great Extent, and is of long ſtanding; or where the Patient is afflicted with a Cancer in more Parts than one; in either of theſe Caſes the Knife is foreign to our Purpoſe; for as the vitiated Parts can never be entirely extirpated, the Surgeon, by attempting the Operation, will only make matters deſperate, and haſten the Death of his Patient: Therefore the beſt Method of treating an incurable Cancer which is not yet broke or ulcerated is (1.) to endeavour, without uſing any violent means, to prevent it from degenerating into an Ulcer; (2.) to relieve and aſſwage the moſt threatening Symptoms. In this manner we may prolong the Proſpect of Death, and many other Miſchiefs, by a palliative Method.

Palliative Method.

XI. If any one is deſirous of palliating this dreadful Caſe, he muſt look for Aſſiſtance, not from Medicine alone, but principally from a diligent Obſerva-

[a] *In Lib. de Gangrænâ, cap.* VII. [b] *Aphoriſm.* 38. §. VI. *quibus occulti Cancri fiunt, eos non curare (ſive attingere) melius eſt. Curati enim cito pereunt, non curati verò longius tempus perdurant.* [c] *Lib.* V. *Cap.* XXVI. §. 2. [d] See *Memoires de Madame* DE MOTEVILLE, *Tom.* V.

tion of Rules with regard to Diet; which we have already explained at large in diſcourſing of a *Scirrhus*. (*Chap.* XVI. §. 6, *&c.*) The Patient ſhould loſe Blood in Spring and Autumn; but, if of a plethoric Habit, oftener; and the Bowels ſhould be conſtantly kept open. It would not be amiſs alſo to adviſe the uſe of *Goats Milk*, unleſs the Patient has a particular Averſion to it; you may give it either alone, or boiled with Vulnerary Herbs or Crayfiſh: By this method you may very ſucceſsfully prevent very dangerous Symptoms. But if notwithſtanding all this, violent Pains ſucceed, it will be proper to give him a Doſe of *Opium* now and then, or to boil *Sem. Papav.* in his Drink; or you may make an Emulſion of them. Theſe Medicines, by giving Sleep, are excellent Remedies againſt Pain and Weakneſs. The ſame Method is to be obſerved with regard to external Treatment, which we preſcribed in the above cited Place.

How an ulcerated Cancer is to be treated.

XII. Almoſt the ſame Method is to be obſerved in treating a Cancer that is broke or ulcerated; only in this Caſe the Part is to be kept clean, the *Sanies* frequently wiped off, and the Ulcer to be filled with ſoft dry Lint; or in order to leſſen the Pain, the Part may be anointed before it is dreſſed, with ſuch Medicines as obtain moſt Credit for anſwering this Intention: The principal of theſe are *Ol. Myrrhæ per deliquium, vel ejus Eſſentia cum Eſſentiâ Succini, vel Aqua Calcis ſola, aut pauxillo Sacchari Saturni admixto. Vel,*

℞ *Aceti Lithargyriſati* ℥j ß. *Olei Roſacei aut Solani* ℥j. *m. f. in mortario plumbeo aut vitreo Unguentum. Vel,*

℞ *Aq. Roſar. Flor. Sambuc. Papav. erratic. ana* ℥ij. *Sacch. Saturni, Eſſent. Opii ana* ℥j. *Spirit. Vini Theriacal.* ℥ij. *M. Vel,*

℞ *Aq. Sperm. Ranar. Solan. ana* ℥iij. *Plumb. uſt.* ℥j. *Sacch. Saturni* ℥ß. *M.*

In the place of theſe you may ſubſtitute a vulnerary Decoction *ex Herb. Marrub. Agrimoniæ, Veronicæ, &c.* or *Succ. Solan. & Plantagin.* The Ulcer may be very eaſily waſhed with any of theſe at every Dreſſing, and the Lint may be wetted with them. But if the Pain ſhould be very violent, you may then encreaſe your Doſe of *Opium* or Eſſence of *Opium*, or you may moiſten the Pledgits with Eſſence of *Opium* at every Dreſſing: Since it will be impoſſible to aſſwage the Pains with a leſs powerful Medicine. The Eſſence of *Opium* to be uſed in this Caſe, is not to be prepared *cum Spiritu Vini*, but rather *ex Aquis deſtillatis, ex Solano, Floribus Papav. Erratic.* DIONYSIUS adviſes a raw Piece of Veal to be laid on the Part. Dry Powders ſhould never be ſprinkled upon a Cancer, as it is cuſtomary on other Ulcers. The Dreſſing with *Plumbum uſtum cum Sem. Lini aut Pſyllii Mucilagine miſt.* mitigates the Pain in a ſurpriſing manner; varying the Application in this Caſe is very uſeful, but we ſhould ſtick moſt to thoſe Remedies which ſeem to agree beſt with the Patient. Laſtly, the *Aqua Vulneraria ſive Sclopetaria*, commonly known by the Name of *l'Eau d'Arquebuſade*, prepared with *Aqua Solani* rather than with Wine or Spirits, being laid on warm and frequently repeated, is of eminent Service.

How a Cancer is to be extirpated.

XIII. When the Cancer is ſo circumſtanced that you may venture upon Extirpation without Danger of any conſiderable Miſchief; you are firſt to adminiſter mild cathartic Medicines, to cool and correct the Acrimony of the Blood,

(§. 11.)

(§. 11.) but more particularly to prepare the Patient by an exact Regimen with regard to Diet, before you attempt the Operation. The Inſtruments which are uſed in taking off Cancers of the Lips, Eyes, *Mammæ*, and Parts of Generation in the Male, you will find deſcribed below in their proper Place, when I come to treat profeſſedly of Chirurgical Operations: The Wound is to be dreſſed in the ſame manner which we have directed for treating other Wounds; to wit, with a digeſtive Ointment, and vulnerary Balſam. The Dreſſings ſhould be laid on lightly, and but ſeldom repeated, which will greatly conduce to the Cure. When the Wound is healed the Patient ſhould obſerve a very ſtrict Regimen with regard to Diet through the remaining Part of his Life; he ſhould entirely abſtain from all acrimonious, ſalt, acid, or ſpiced Meats; he ſhould frequently take gentle cooling Purges, the beſt of which are the Purging medicated Waters; not omitting to loſe Blood by Cupping or the Lancet whenever he perceives any Fulneſs, particularly at Spring and Fall; for if theſe Rules are neglected, the *Scirrhus* and Cancer eaſily return.

CHAP. XVIII.

Of an OEDEMA.

An *Oedema*, what. I. HITHERTO we have been treating of Tumors that ariſe from Inflammation, and of the ill Conſequences that attend them; we proceed now to deſcribe that ſort of Tumor which is attended with Paleneſs, Cold, and yields little Reſiſtance, retaining the Print of your Finger when preſſed with it, and accompanied with little or no Pain. The Name proper to this Tumor is *Œdema*, or a *Phlegmatic Tumor*: It obtains no certain Situation in any particular Part of the Body, ſince the Head, Eyelids, Hands, ſometimes Part of the Body, ſometimes the whole Body is afflicted with it. When the laſt mentioned is the Caſe, the Patient is ſaid to be troubled with a Cachexy, *Leucophlegmatia*, or Dropſy: But if any Part of the Body is more ſubject to this Diſorder than another, it is certainly the Feet, which are at that time called ſwelled or œdematous Feet. We ſhall treat diſtinctly of them in this Place, that it may appear what is the true Nature and rational Method of Phlegmatic Tumors, in whatever Part of the Body they ſhall be found.

Cauſes. II. The proximate Cauſe of an *Œdema* is doubtleſs to be found in the too great Seroſity or Viſcidity of the Blood, which ſtagnates in the very minuteſt Veſicles of the Fat, or *Tunica Celluloſa*, and by this means ſtretches out the Skin with which it is immediately covered. This vitiated State of the Blood chiefly ariſes in Men, (1.) who are either of a cold and phlegmatic Habit of Body, or are advanced in Years: It chiefly falls upon them in cold Weather, or in the Winter, when the Inclemency of the Seaſon heightens the Diſorder of Nature. It is no wonder therefore that Perſons whoſe Legs ſwell greatly in the Day, frequently find themſelves much lighter and ſlenderer in thoſe Parts every Morning, which certainly proceeds from the Warmth they received in Bed. (2.) Another Cauſe of this Diſorder, is *an Irregularity in Diet*, by over eating or drinking, and by the conſtant uſe of crude, cold, and hard Meats. (3.) *Intermitting Fevers or Agues* conduce very much to this Diſorder, eſpecially if the

Patient indulges himſelf in an intemperate uſe of cooling Liquors whilſt the hot Fit is upon him, and his Thirſt very urgent. (4.) This Diſeaſe frequently owes its Riſe to *too plentiful a Diſcharge of Blood* from a Wound, from the Noſe or Lungs, by vomiting, or from the hæmorrhoidal Veſſels or *Uterus*. Or, (5.) Sometimes to *Obſtructions of the menſtrual Diſcharge* in Women: Or, (6.) To *a Compreſſion of the Vena Cava*, by the Weight of the *Fœtus* in Women far gone with Child, or by any ſcirrhous Body in the *Abdomen*; which greatly hinders the return of the Blood from the lower Limbs: Or, (7.) To *too ſedentary a way of Life*, or to too great an Indulgence in lying in Bed or ſleeping: Or laſtly, (8.) To a *Phthiſis and Difficulty of Breathing*, or to any Diſorder or Fatigue of Body, which diſturbs or deſtroys the natural Force of the Heart in maintaining the Circulation with due Vigour.

III. From what has been delivered, it plainly appears by what Signs an *Œdema* manifeſts itſelf. Therefore this Obſervation alone remains to be added, that the harder the Tumor is, and the longer the Pitting which is made by the Finger remains viſible, the ſtagnating Fluid is in ſuch Proportion thicker and more tenacious. *Diagnoſis.*

IV. Œdematous Tumors that come with other Diſeaſes, as a Dropſy, Conſumption, Aſthma, Intermitting Fever, or with an Increaſe or at the going off of the menſtrual Diſcharge, can ſeldom be cured but by curing the Diſtemper from whence they ariſe. Œdematous Tumors of the Legs are of very little Conſequence in Women with Child, eſpecially if they are naturally of a good Habit of Body: For the Preſſure being taken off the *Vena Cava* by the Delivery of the Woman, the Tumor quickly diſappears in Conſequence. But weakly Women do not come off ſo well in this Caſe, particularly if the Tumors remain long after Delivery, for they are, in this Caſe, frequently the Forerunners of Dropſy, Aſthma, and Death. The more inveterate theſe Phlegmatic Tumors are, by ſo much the more dangerous and doubtful are they to be eſteemed: On the other hand, thoſe that are recent and attended with no other Diſeaſes are very eaſily cured. Thoſe that are Attendants on an Intermitting Fever are cured with much greater eaſe, than thoſe which are the Conſequence of a large Profuſion of Blood, or of any other Weakneſs. Thoſe which ariſe from an Obſtruction of any natural Diſcharge, are cured by the return of that natural and cuſtomary Diſcharge of Blood. Young Perſons are more readily cured of theſe Tumors in the lower Limbs than old, for indeed Perſons advanced in Years are generally incurable in this Caſe. When Tumors of the Legs and Feet are treated with improper Remedies, eſpecially externally, Aſthma and Death will by degrees be the neceſſary Conſequences. *Prognoſis.*

V. The method of treating œdematous Tumors is ſupriſingly different, according to the different Cauſes to which they owe their Riſe; therefore we are firſt to make diligent Search after the genuine Cauſe of the Diſorder before we attempt its Cure: And as from the Nature of the Diſtemper the internal Parts are to be ſet right, we muſt by no means put our whole truſt in external Remedies, but are chiefly to expect Help from internal Medicines preſcribed by a *prudent Phyſician*. The external method of treating theſe Tumors in the Legs and Feet, is uſually, (1.) To have recourſe to frequent *Frictions* with warm Cloths, to be repeated Morning and Evening till the Parts grow red and hot: (2.) Then the Limbs are to be diligently preſerved from the Injuries of the *Method of Cure.*

cold Air; for which end he may wear Stockings made of ſome warm Furr, and at Night he ſhould keep hot Bricks about his Legs and Feet, to attenuate the Blood. (3.) After this you may apply a proper Bandage which is to aſcend gradually from the Feet up to the Knees; this ſtrengthens the Limb, and prevents a Collection and Stagnation of the Blood in any Part of it. (4.) After the uſe of proper internal Medicines, and the external methods which we have juſt mentioned, it will be very proper to uſe ſtrengthening Remedies externally; to this end you may place the Limb over burning Rectified Spirits of Wine, wrapping it up in Cloths, in ſuch a manner that it may receive the Steam; this will incline the ſtagnating Fluids to eſcape through the Skin, or render them fit to return into the Circulation, and at the ſame time reſtore the natural Tone to the Limb. (5.) Many, eſpecially amongſt the common People, apply, as a Family Medicine, the *Chelidonium majus*, firſt bruiſing it, and then laying it on as a Cataplaſm. Others apply in the ſame manner the *Peſticaria acris*, either alone or mix'd with the forementioned Remedy, and from this method they frequently find great Relief; for they are very active Medicines, and powerful Reſolvents. There are ſtill others again which uſe *Raphanum Ruſticanum raſum*, or *Lepidium*, which they boil in Wine and apply hot for the ſame end. But the moſt excellent Remedy to execute this Intention ſeems to be the Cataplaſm which is prepared *ex Columbarum Fimo, Sale atque Aceto inter ſe invicem commixtis, calidè ſæpiùs impoſito.* Of the ſame Virtues are Fomentations made *ex Cineris Querni Lixivio parat. cum Aq. Fabri Ferrar. addendo Spirit. Vini uncias aliquot, Aluminiſque portiunculam.* This may be applied with Stuphs, or the Legs may be bathed in the Liquor as warm as it can be well borne, twice every Day. *Aqua Calcis* is ſaid to be of equal Service, uſed in the ſame manner either alone or mixed *cum Spiritu Vini & Alumine.* The following Mixture alſo anſwers the ſame Intention:

℞ *Spirit. Vini, Aceti Vin. ana* ℔ j. *Alumin. crud.* ℥ j ß. *Vitriol.* ℥ j. *M.*

This is to be applied as we directed: But you muſt carefully take notice, that after rubbing and fomenting, the Legs are to well covered with Bandages and Stockings; the Patient ſhould drink ſparingly, uſe moderate Exerciſe frequently, and be very diligent in the uſe of proper internal Remedies. Sometimes the medicinal Waters, particularly thoſe of the ſulphureous kind are found very ſerviceable in this Caſe, but not always. HARRIS a celebrated *Engliſh* Phyſician, in *Diſſert. Chirurg.* IX. relates that he has cured the moſt dangerous of theſe Caſes *cum Croco Marteis aperitivo, Cortice Peruviano miſt.* others affirm they have done it with the *Cortex* alone; others again are confident that this is a hurtful and dangerous Method. The beſt way is to conſult ſome prudent Phyſician, who beſt knows how to adviſe you what Methods to purſue, and what to avoid.

CHAP.

CHAP. XIX.

Of [a] FUNGOUS TUMORS, *and* DROPSY *of the* JOINTS.

I. *OEDEMATA* are nearly reſembled by fungous Tumors of the Joints: Theſe are Diſorders of very bad Conſequence, and therefore deſerve a particular Diſquiſition. That they have been entirely omitted or ſlightly paſſed over by many Chirurgical Writers, ſeems to proceed from their Ignorance of the true Cauſe from which they ariſe; for whether they owe their Origin to a Collection of Blood or ſerous Fluids; corrupted Matter, *Pus*, *Flatus*, or to any other Cauſe, they could not pretend to diſtinguiſh. When we ſpeak of a *Fungous Tumor of the Joints*, we mean that Tumor of the Limb which ariſes at the Joint, looks pale, is void of Heat and Pain, eaſily yields to the Preſſure of the Fingers, but riſes again inſtantly, like a *Fungus*, upon removing the Finger, leaving no Pit behind. Though no Joint either of the upper or lower Limbs can be ſaid to be ſecure from this Diſorder, yet the *Knees* are moſt ſubject to it, becauſe they abound in a large Quantity of Fat and glandular Bodies, which are concealed amongſt the Ligaments and Tendons. There are ſeveral Species of this Tumor: For ſome are ſmaller, ſome larger, ſome ſofter, ſome harder, ſome more, ſome leſs glutinous with regard to the State of the inſpiſſated Fluid. [b] In ſome the noxious Humours are ſituated without the Joint, which kind of Tumors are properly the fungous Bodies we are now treating of; but in others they are collected and retained in the Joint itſelf, as the *Serum* is contained in the Teſticle in an *Hydrocele*, many of which I have ſeen and cured: This laſt mentioned Diſorder may not improperly be called a *Dropſy of the Joint*, and may probably be diſtinguiſhed from the fungous Tumor of the Joint, by the Enlargement that appears all round the Joint; whereas the fungous Tumor is ſituated more on one or the other ſide of it. From what has been already ſaid of theſe two Caſes, I think it plainly appears that it is no difficult Matter to diſtinguiſh one from the other. A fungous Tumor, what.

II. The proximate Cauſe of fungous Tumors is without doubt the viſcid glutinous *Serum* which is found about the Ligaments of the Joints, which is apt to ſtagnate after the Ligaments have received any conſiderable Violence from a Fall or Blow. Sometimes the Tumor riſes in the external Parts, ſometimes in the Articulation itſelf, by which the Ligaments being weakened, the Part loſes its natural Motion: But when the Nerves or Blood-veſſels are greatly preſſed upon by the Tumor, the Parts below are uſually deprived of Nouriſhment, and the Joint by degrees being greatly enlarged, the neighbouring Parts diminiſh and waſte. Cauſes.

[a] In *England* they are known to us by the Name of White Swellings, or Scrophulous Tumors of the Joints. [b] PURMANNUS in his *Chirurgia Curioſa* has given us a Deſcription of a very large *Fungus*.

Prognoſis. III. We have already obſerved that in fungous Tumors of the Joints, the Ligaments are too much lengthened and relaxed, and the natural Strength and Motion of the Limb are leſſened in Proportion to the degree of the Diſorder; and as the loſt Vigour of the Part is very difficult to be reſtored, and the Tumor will not readily yield either to Suppurants or diſperſing Remedies, any one will be ſenſible that the Surgeon has no eaſy Taſk upon his hands, when he undertakes the Cure of a fungous Tumor upon the Joint. The Suppuration of the Part is not only difficult to bring about, but it is generally a very dangerous Attempt; for by this means *Caries* and incurable *Fiſtulæ* are ſometimes produced, which require Amputation of the Part. When the Tumor is recent, and not very large or hard, it ſometimes admits of Cure by the Application of digeſtive and corroborating Remedies, when they will be greatly irritated by emollient Applications: But where the Tumor is large and inveterate, no Succeſs is to be expected from any thing but the Knife, and even that is ſometimes unequal to the Cure, or improper. If the noxious Fluids are contained in the Joint, they may be let out by Inciſion, but upon healing the Wound, the Tumor will generally return.

Cure of recent fungous Tumors by Diſperſion.

IV. In order to render the Cure of recent and mild fungous Tumors the eaſier by diſperſing Remedies, it will be beſt to rub the diſordered Part well every Day with warm Cloths, fomenting it afterwards with *Spirit. Vini tartariſat.* This Method is to be conſtantly obſerved till the natural Strength and Form of the Limb are reſtored. PURMANNUS's Fomentation is excellently calculated for this Purpoſe:

℞ *Muriæ Halecum* ℔ ij. *Acet. Vini fortiſſim.* ℔ j. *Fol. Salv. M.* ij. *Vitriol. Rom.* ℥ j ß. *Alumin. crud.* ℥ vj. *M.*

Theſe Ingredients are to boil together for half an Hour, and to be uſed in the manner we have above deſcribed: When the Tumors begin to diſperſe, and the Parts to recover their Strength, it will be very beneficial in perfecting the Cure, to foment the Limb well ſeveral times every Day *cum Spiritu Vini Tartariſati, vel cum Oleo Tartari fœtido*, laying on the Bandages immediately afterwards to keep the Part warm and defend it from the Injuries of the cold Air, of which it is very ſuſceptible. Laſtly, I cannot help adding a Form under this Head, by the Aſſiſtance of which I have frequently made very happy Cures of fungous Tumors:

℞ *Lithargyr.* ℔ ß. *Boli Armen.* ℥ j. *Maſtiches, Myrrhæ, ana* ℥ ß. *Aceti Vini* ℔ j. *m. & coque hæc omnia per horæ quadrantem, tinctiſque in iſto Decocto linamentis craſſis, calida ſemper & matutino & veſpertino tempore in lectulo applicentur.*

At the ſame time proper purging Medicines, Attenuants, and Sudorifics ſhould be diligently attended to.

Cure of inveterate *Fungus's*, (1.) By the Knife.

V. If the fungous Tumor is of long ſtanding, and will not give way to the diſperſing Remedies which have been preſcribed, almoſt the only hope left, is to make an Inciſion into the dependent and moſt convenient Part of the diſeaſed Joint, taking great Care to avoid wounding the Ligaments or Tendons; you are well juſtified in following this Method, by the Examples of thoſe two celebrated

celebrated Surgeons [a] WURTZIUS and [b] PURMANNUS. By this means the ſtagnating *Serum* is inſtantly evacuated if it is contained in one Cavity; but if it is contained in different Cells it will all eſcape in a few Days. Tents daubed with ſome digeſtive Ointment and ſprinkled with Allom are ſerviceable in this Caſe. Before you make your Inciſion, you ſhould pull the Tumor down as low as you can with your Fingers, and make a tight Bandage above to retain it in this Situation. By this means the moſt convenient Part for the Inciſion to be made in, will lay fair, and when the Opening is made, the *Serum* will readily burſt out like Blood at the opening a Vein, or Lymph in tapping for the *Hydrocele* or *Aſcites*. When this is done, if any Tumor ſtill remains, dreſs the Part with *Emplaſtrum Diachylon vel Oxycroceum, vel* WURTZII *rubrum, vel Aqua Calcis, vel Spirit. Vini*; by continuing any of theſe Applications, what remains inſpiſſated in the Tumor will entirely diſperſe. When the Limb is reſtored to its natural Shape, heal the Wound with vulnerary Balſams, diligently avoiding the uſe of fatty or oily Medicines, as being very hurtful to the Tendons and Ligaments, with which thoſe Parts abound. If the *Serum* contained in the Tumor is ſo glutinous that it cannot diſcharge itſelf for want of Fluidity, you muſt throw up attenuating injections at every Dreſſing: The beſt calculated for this Purpoſe are thoſe which are prepared *ex Decocto Agrimoniæ, Ariſtolochiæ, aut Alchymillæ cum Roſarum aut Chelidonii Melle miſto.* Injections of this kind will quickly diſſolve the ſtagnating *Serum*, and diſperſe the Tumor.

VI. Though thoſe fungous Tumors which are opened with the Knife are more readily diſcharged and healed, yet ſome Surgeons prefer the Application of cauſtic Medicines to the Knife, diſcharging the collected *Serum* upon the falling off of the Eſchar, after which they proceed in the ſame manner which we adviſed above. Whilſt the Part is healing, in either Caſe I think it would be very proper to warm and invigorate the Ligaments and Tendons, eſpecially when the Injury falls upon the Knee, by the uſe of ſome nervous Ointment, or aromatic Spirit. (2.) By Corroſives.

VII. It very frequently happens, that after you have evacuated the inſpiſſated *Serum* and cicatriſed the Wound, you ſhall have a freſh Collection of a vitiated and corrupt Fluid, which I am an experienced Witneſs of. To prevent this Accident the following Method will be ſerviceable, let the Patient continue in a ſtrict Courſe of proper purging, ſudorific, and attenuating Medicines, and keep the Wound open with Tents for a conſiderable time, cleaning it every Day by throwing up an Injection prepared in the manner we directed in the preceding Section. PURMANNUS highly commends this manner of keeping the Wound clean, and atteſts that after the ſixth time of injecting he has not only ſeen the Wound clean, but filled up with new Fleſh. It will be proper alſo to inject *Aqua Calcis vivæ* ſometimes, and to cover the external Part with a warm Plaſter, or to foment it with ſome Liquor of the ſame Intention. This Method is recommended by that experienced Surgeon FELIX WURTZIUS, as the moſt likely means of preventing the return of the Diſorder. Remed'es to prevent the return of the Tumor.

[a] *Chirurg. p.* 268. [b] *Chirurg. P.* III. *p.* 46. *in. Chirurg. Curioſ. p.* 622.

VIII. Before

When an Opening is not to be made.

VIII. Before I leave this Head I muſt inform you, that *it is not every fungous Tumor of the Joints which is ſo ſituated that it can be opened with Safety.* For if the Tumor is of very long ſtanding, hard, of a great ſize, or the Patient is of an infirm weakly Habit of Body, you muſt entirely lay aſide the Knife: For this method of Treatment would produce more Miſchief than Good, by laying a Foundation for new Diſorders; to wit, *Caries*, *Fiſtulæ*, and *Gangrene*. As to the other Species of Lymphatic or Phlegmatic Tumors which require the Knife, ſuch as *Dropſy*, *Hydrocele*, *Hydrocephalus*, and *Ranula*, I ſhall treat more fully of them in their proper Place, when I come to deſcribe Chirurgical Operations.

THE

THE FIFTH BOOK OF THE FIRST PART. OF ULCERS.

CHAP. I.

Of ULCERS.

I. AN Ulcer is a Diſorder ſo well known to every one, that when I have mentioned the Name, it would be impertinent to illuſtrate it with a Deſcription. A Definition in this Caſe would only ſerve to make the Matter more obſcure. You have a very juſt and clear Notion of an Ulcer when you are told that it is a *Solution of the ſoft Parts of the Body and the Skin*, ariſing from an internal Cauſe, *ſc.* an Inflammation, Abſceſs, or ſharp Humours. Wounds alſo and Contuſions by length of time degenerate into Ulcers, and properly aſſume that Name. An Ulcer, what.

II. The proper Seat therefore of an Ulcer, is any ſoft Part of the Body, *ſc.* the Skin, Fat, Glands, Muſcular Fleſh, and even the *Viſcera*. If any of the hard Parts of the Body, that is, if the Bones are ulcerated or corroded, the Diſorder is rather called a *Caries* or *Spina Ventoſa* than an Ulcer; but from the Similitude there is between both Caſes, I think they may very properly be treated of under the ſame Head, and I have therefore joined them together. Its Situation.

III. If you deſire to know how Ulcers differ from *Abſceſſes*, *Contuſions*, and *Wounds*, a diligent Examination into the Nature of each, will give you full Satisfaction upon this Head. Though *Wounds* and *Contuſions* as well as *Ulcers*, conſiſt in a *Solution of Continuity of the ſoft Parts of the Body*, yet they widely differ in this Circumſtance; to wit, Wounds and Contuſions always ariſe from an external Cauſe, and are produced in a Moment; whereas Ulcers owe their Riſe chiefly to internal Cauſes §. 1. and come on by ſlow Degrees. *Abſceſſes* are as it were the firſt Beginnings of Ulcers, or rather are immature Ulcers, Difference from other Diſorders.

which

which is the Caſe when Inflammations come to Suppuration, the Skin ſtill remaining whole; but as ſoon as an Opening is formed in the Skin, and the maturated *Pus* diſcharges itſelf, from Abſceſſes they become Ulcers, whether the Skin is eroded by the *Pus*, or the Opening made by the Surgeon's Inſtrument.

Various kinds of Ulcers.

IV. Ulcers cannot be confined to one Species, for they differ, (1.) In the Part of the Body which they infeſt; for ſometimes they are found in the Skin, Fat, and Glands, ſometimes in the Muſcular Fleſh: (2.) In their Size; for ſome are ſpread wide, others occupy but a ſmall ſpace; ſome are deep, others ſhallow; thoſe which penetrate deep and are narrow, particularly if they are very ſmall at their Opening, are called *Sinuſes* or *Fiſtulæ*: (3.) In their ſtanding; whence they are called *recent* or *inveterate*: (4.) In Number and Degree of Symptoms, or accidental Diſorders that attend them; ſome are very mild, and are thence called *benign*; others are *malignant*, that is either *attended with very acute Pains*, or *fetid*, *putrid*, *fatty*, *diſcharging great Quantities of Ichor*, *ſpreading wide*, *cancerous*, *callous*, *fiſtulous*, or *attended with Worms*: (5.) In their Cauſes; hence Ulcers are called *ſcorbutical*, *venereal*, *carious*, *cancerous*, *peſtilential*, or are ſaid to be occaſioned by *Faſcination*: Laſtly, (6.) Ulcers differ in their Situation, and are called *Ulcers of the Noſe*, *Fauces*, *Breaſt*, *Anus*, and *Fiſtulæ Lacrymales*, as they attack this or that Part.

Cauſes.

V. I think thoſe Phyſicians amongſt the Moderns, draw too haſty a Concluſion, who aſſert that the *principal Foundation of Ulcers* is owing to a *foreign acid Humour*, which corrodes and deſtroys the Parts of the Body which it falls upon, in the ſame manner that *Aqua fortis* would; ſince there is no acrimonious Humour, whether it is of a ſalt, lixivious, alcaline, or acid Nature, but would corrode the Body, and raiſe an Ulcer of ſome kind: And to ſay truth, the ſtagnating Blood generally degenerates into an Acrimony of the alcaline kind, and is by no means, according to the Opinion of ſome, converted into an acid: This you may collect from the fetid Smell of Ulcers. The Phyſicians have pronounced an *Alcali* to be any Saltneſs or Acrimony, which is adverſe to all kinds of Acids, as Salt of Tartar is to Vinegar, Oil of Tartar *per deliquium* to Spirit of Vitriol; as there are many kinds of Poiſons, ſo of acrimonious things, and therefore of Ulcers. The more Virulence the Acrimony is poſſeſſed of, by which the Body is corroded, ſo much the worſe will be the Conſequence of ſuch Corroſion; the Ulcers will be the more fetid, the more dangerous, perhaps incurable, which is the Caſe in Cancers. But Ulcers do not ariſe from Acrimony alone; but from any other Cauſe by which the Blood may be made to ſtagnate and corrupt. Upon this principle you frequently ſee *Tumors*, *Inflammations*, *Wounds*, *Contuſions*, *Fractures*, *Luxations*, *Scirrhus*, *Cancer*, and *Caries* degenerate into Ulcers; which though they begin with very ſlight Symptoms, yet, either from a bad Habit of Body, Irregularity in Diet, or Ignorance in the Surgeon, they very often become extremely dangerous.

Diagnoſis of inveterate Ulcers.

VI. Although moſt Ulcers may be diſcovered by the Sight, yet in order to have a thorough Knowledge into the Depth and Tendency of the *Sinus*, and whether it is accompanied with a *Caries* of the ſubjacent Bone, you muſt have recourſe to the uſe of the Probe; you will learn beſt from the Patient whether it be recent or of long ſtanding: From him alſo you may collect the Cauſe of the Inveteracy of the Diſorder; whether it is owing to a ſubjacent *Caries*, to an irregular Courſe of Life, or to the unſkilful Treatment of the Surgeon. The Ulcer

Ulcer is ſaid to be *benign*, if it is recent, and attended with no violent Symptoms; if the *Pus* is of a moderate Conſiſtence, whitiſh, without Acrimony, and of no bad Smell: On the contrary, it is called *malign*, if the Patient is of a weakly, ſcorbutical, or hydropical Habit of Body; if the *Pus* is too fluid, acrimonious, fetid, yellow, brown, green, or blackiſh, or of the Conſiſtence of Lard. The Diſorder is equally dangerous, where the Patient ſuffers very intenſe Pain, or where the Ulcer is formed that it cannot admit of being treated like Wounds and recent Abſceſſes, with Digeſtives and Vulnerary Balſams.

Nature of putrid, running, corroding, fiſtulous, and callous Ulcers.

VII. *Ulcers* are ſaid to be *unclean and putrid*, in which the Fleſh appears corrupted, ſoft, white, livid; where the Matter is thin and glutinous, and at the ſame time green or variegated. They are called *running Ulcers*, when there is a very plentiful Diſcharge of a thin *Sanies*. *Corroding and ſpreading Ulcers* if the Matter is corroſive enough to deſtroy the adjacent Parts, ſometimes ſlower, ſometimes faſter, in proportion to the degree of Acrimony of which it is poſſeſſed. *Fiſtulous Ulcers* are thoſe which penetrate deep, under the Skin, or between the Muſcles, eſpecially if the *Sinus* is wide, and the Opening very narrow. In *callous Ulcers* the internal Parts of the Ulcer are lined with a hard and almoſt cartilaginous Subſtance.

Nature of venereal, cancerous, *carious* Ulcers, and of thoſe which are occaſioned by Charms.

VIII. *Ulcers* are termed *venereal*, when they are the Conſequence of Familiarity with an infected Perſon, and either accompany or ſucceed other venereal Diſorders. They are confined to no particular Part, but more frequently ariſe in thoſe Parts which are the Seats of venereal Bubos, or in the Noſe or Throat, ſometimes alſo upon the *Penis*; Ulcers of this laſt mentioned Part are called by the *French*, *Chancres:* In the other Sex the *Labia Pudendi*, or Neck of the Womb, are chiefly obnoxious to this Symptom of the Pox. *Cancerous Ulcers* are either Cancers themſelves burſt out, the Signs of which we have given you above in *Book* IV. *Chap.* XVII. §. 5, 6. or very nearly approach the Nature of *Carcinomata*, if you regard the degree of Pain with which they are affected, or the quickneſs of their Increaſe. *Ulcers* are called *carious*, when any neighbouring Bone is deprived of its *Perioſteum*, or affected with a *Caries*. But we ſhall treat more fully of this Caſe below. *Ulcers* are by the Vulgar believed to ariſe from *Faſcination*, when Needles, Hairs, Threads, Rags, Egg-ſhells, Coals, or any preternatural Body of this kind is found in an Abſceſs or Wound. But in good truth, it is my Opinion, that not only the Signs by which the common People pretend to diſcover Charms, but even Faſcination itſelf, is an Impoſition which can be ſwallowed by none but Perſons loaded with Superſtition; for many Ulcers have been ſaid to be owing to Faſcination and Witchcraft, which have evidently proceeded from natural Cauſes.

Prognoſis of malignant inveterate Ulcers.

IX. Recent and benign Ulcers, like recent Abſceſſes, are generally attended with no great difficulty in the Cure, eſpecially if they happen to young and well exerciſed Subjects. The difficulty of the Cure will ariſe in Proportion to the Malignity of the Symptoms and the Inveteracy of the Diſorder. Therefore *putrid*, *running*, *fiſtulous*, *callous*, *carious*, and *cancerous Ulcers* require great Skill and Addreſs in the Cure. Thoſe quackiſh Perſons who boaſt of a ſecret Plaſter or Ointment for the Cure of Ulcers of ever ſo great Inveteracy, or attended with the worſt of Symptoms, egregiouſly impoſe upon themſelves and their credulous Patients. If the Patient is weak and infirm, advanced in Years, has great Acrimony in his Blood; if the Ulcer has a very offenſive Smell; if the

Pus is of a bad Colour, and full of Acrimony, any of these Circumstances will render the Cure of the Ulcer very difficult. If there are many Ulcers, or if an Ulcer spreads very wide, the Discharge will be very plentiful, and reduce the Patient wonderfully. It is never good Practice to heal old Ulcers of the Legs, especially in weak Habits, or in Persons advanced in Years: For Experience teaches us, that they are always in the best State of Health whilst this Drain is kept open in their Legs; but if you heal the Ulcer, and stop up the Discharge, the worst of Disorders follow, to wit, Pains in the Head, Vertigines, Apoplexy, Epilepsy, Difficulty of Breath or Asthma, Diarrhœa, Dysentery, and Inflammations on the internal Parts, and many other Disorders of this kind, till Death brings up the Rear. That excellent Physician CRATO deserves to be consulted upon this Head, in his *Epistolæ Medicæ*, where he treats this Point very judiciously. Where inveterate Ulcers dry up upon old Subjects, and the Lips grow hot and livid, there is immediate Danger of *Sphacelus* and Death itself. The Cure of inveterate Ulcers is much easier in young and robust Subjects; but you will always find it a useful and indeed necessary Observation to you, that in Ulcers of this kind, you are not only to remove the immediate Cause of the Disorder, but you are also to restore the Blood to its pristine Purity, and in doing this you will usually meet with great Difficulty; therefore if the Disorder is very inveterate, and the Patients are tired with the continual Use of Medicines, and with the strict Regimen to which they are enjoined, it is no wonder if these Ulcers often fail of a Cure, even in robust Persons.

Prognosis of venereal, fistulous, callous, *carious* and cancerous Ulcers.

X. *Venereal Ulcers* cannot be cured till you have thrown the venereal Poison out of the Body by proper Remedies; till you have done this, external Remedies are to no purpose. *Fistulous*, *callous*, and *carious Ulcers* are never cured without the Knife, for if you heal the Ulcer and bring on a Cicatrix, it will burst out again, and afflict the Patient with greater Vehemence; a *Caries*, especially if it is large and situated in the Joint, will bring on so large a Discharge of Matter, that if the Limb is not taken off in time, the Patient will be entirely run down. This will appear very plain to you when you read what will follow in its place, on the *Caries* and *Spina Ventosa*; the same may be said of cancerous Ulcers; for if the Part affected is not taken off, there remain no Hopes of Cure, as we declared above, treating of a *Cancer:* But even after taking off the Part, Cancers frequently return, and entirely destroy the Patient. When Ulcers fall upon the *Viscera*, they are generally deemed incurable, because out of reach, both of the Hand and of immediate medical Applications.

Cure of recent Ulcers.

XI. The method of treating Ulcers differs greatly according to the different Nature of the Disorder. When the Ulcer is quite recent, it may be treated as a recent Abscess or Wound: First, therefore it is to be cleansed, then to be filled with new Flesh, and lastly to be covered with an even Cicatrix.

1.) How the Ulcer is to be cleansed.

XII. The Ulcer is to be cleansed in the following manner: First, the Matter is to be discharged; if it does not flow freely enough of itself, you must press gently with your Fingers; if there is a deep *Sinus*, you may clean it with an Injection, or if it lays fair enough, with Lint; any small Membrane or fatty Body that remains corrupting at the bottom of the Ulcer will readily enough cast off afterwards, at the Removal of every Dressing, which should be a digestive Ointment spread upon Lint, and secured upon the Part with *Diachylon*, *Diapalma*, or any other Plaster of that kind, covering the whole with proper

Compreſſes and Bandages. This Method is to be continued till the Ulcer appears to be entirely cleanſed, that is, till the *Fundus* of it becomes florid, and it appears to be filled with new Fleſh.

XIII. Having proceeded thus far, the next Intention is to fill up the Ulcer with new Fleſh. This Intention is ſatisfied with thoſe Medicines which are vulgarly called *Sarcotics*. The beſt of this ſort appears to me to be the common *Unguentum Digeſtivum*; for where there is no remarkable Impediment, I have never found it neceſſary to uſe any other ſarcotic Remedy than this. It is not eaſy to ſay what ſhould induce almoſt all Phyſicians to cry up certain balſamic Remedies as having a peculiar Virtue in generating new Fleſh: Beſides, our Digeſtive is endued with a balſamic Power; but to ſay the Truth, the Generation of new Fleſh is not ſo much owing to the uſe of any particular Medicines, as to the Benefit of Nature. The whole Buſineſs of the Surgeon in this Caſe is only to remove any thing that may impede the Cure. If any ſhall think that the *Unguentum Digeſtivum* is not equal to this Intention, they may have my free Conſent to ſubſtitute in its room *Balſamum Arcæi*, *Balſamum Peruvianum*, *Balſamum de Mechâ*, *Balſamum Sulphuris*, *Eſſentia Myrrhæ & Aloës*, *Oleum Myrrhæ per Deliquium*, *Oleum Ovorum*, or any vulnerary Balſam of this kind, till the Wound is entirely healed. (2.) How the Ulcer is to be filled up.

XIV. If the Ulcer penetrates very deep, ſo that you can neither reach the Bottom of it with your Eye, nor apply your Medicine to it, it will then be proper at every Dreſſing, as ſoon as you have preſſed the Matter out of it, to inject ſome cleanſing healing Liquor to it, ſuch as *Decoctum Agrimoniæ vel Ariſtolochiæ cum Melle Roſarum, vel & Myrrhæ atque Aloës Eſſentiâ miſtum*, or that which BELLOSTE cries up in his *Hoſpital Surgeon*, *Decoctum ex Nucum Foliis cum admixto Saccharo*. This method of injecting is to be continued till the Bottom is entirely healed: Afterwards you may proceed to fill up the Ulcer in the manner we adviſed above. What is to be done in deep Ulcers.

XV. The Ulcer being filled up with new Fleſh, it remains that we bring on a proper Cicatrix. This is beſt done by dreſſing the Part daily with dry Lint, till the Cicatrix is formed. But if, notwithſtanding this method of dreſſing, the Fleſh becomes luxuriant, and the Ulcer is moiſt, it muſt be ſprinkled with drying Powders, *ex Maſtiche*, *Thure*, *Sarcocollâ*, *Colophoniâ*, *Lapide Calaminari ac Tutiâ*, covering it with dry Lint, and ſecuring all with ſome Plaſter, till it is entirely healed: But if the luxuriant Fleſh has grown above the Skin, the beſt way is to eat it down with *Vitriolum Cæruleum*, or if that is not ſtrong enough, you may uſe the *Pulvis ex Præcipitato Rubro atque Alumine uſto*, till it becomes quite even; and then you may proceed as directed above. (3.) How the Cicatrix is to be formed.

XVI. Laſtly, it is ſcarce poſſible to ſay what great Relief the Patient will receive from obſerving a proper Regimen with regard to his Diet. Practitioners in Surgery have in all times obſerved, that Ulcers of the moſt malign kind have been ſometimes cured by this means, almoſt without the Aſſiſtance of any other Remedy; whilſt on the other hand the moſt benign Ulcers have ſo far degenerated, as to become altogether incurable by an irregular way of living. In this Caſe therefore, the Patient ſhould moſt diligently avoid all acrimonious, ſalt, acid, fatty, or heating Meats, or thoſe that are hard of Digeſtion; according to the Directions which we gave you above when we were treating of *Wounds* (*Book* I. *Chap.* I. §. 45, and the following.) If your Patient already A proper Regimen to be obſerved.

labours under a bad Habit of Body, which obſtructs the Cure, it is your Duty to call for the Aſſiſtance of ſome ſkilful Phyſician, that may take off the conſtitutional Complaint, by preſcribing proper internal Medicines.

CHAP. II.

Of the Method of treating [a] *Fiſtulous Caſes.*

The Cure of *Fiſtulæ* performed, (1.) by cleanſing.

I. WHEN you diſcover, either by your Eye or the Probe, that Ulcers are attended with *Fiſtulæ* [b] not yet become callous, your readieſt way of curing them is to lay them open with the Knife to the Bottom, if you can do it with Safety, and afterwards cleanſe and heal them. But ſince Patients are very unwilling to conſent to the uſe of the Knife, you may cleanſe them with a proper Injection, or dreſs them with *Ung. Digeſtivum* upon Lint, as we adviſed in the foregoing Chapter. Many Surgeons are for conveying their Medicine to the bottom by the Aſſiſtance of *Tents*; but as they are very apt to do Miſchief by their hardneſs, or too great length, bringing on a *Callus*, Inflammation, or too great Flux of Humours upon the Part; therefore I think it moſt adviſeable either to throw them entirely aſide, or at leaſt to guard as ſtrongly as poſſible againſt any of theſe Inconveniences, by making them very ſoft, and as ſhort as the Caſe will admit of. BELLOSTE, and MAGATUS before him, both Men of great Name in Surgery, have been ſo offended at the miſchievous Abuſe of Tents, that they have abſolutely forbid the uſe of them; and I am ſo far from diſagreeing with theſe Authors, that I readily join with them in Opinion. I think the uſe of Tents is never to be juſtified, but where the opening of your *Fiſtula* is ſo ſmall, that you are in conſtant Fear of its healing, and even in this Caſe your Tents can ſcarcely be too ſhort, and ſhould be made of the ſofteſt Materials.

(2.) By Preſſure.

II. The next thing to be obſerved in treating *Fiſtulæ* is, to preſs the *Fundus* as near to the opening as poſſible. When the Ulcer is cleanſed, and the proper Dreſſings applied, you muſt clap a ſmall Compreſs, or a ſlip of Plaſter doubled up in the form of a ſmall Compreſs, upon the Part where you judge the *Fundus* of the *Fiſtula* to be ſeated, ſecuring all with Bolſter, Plaſter, and Bandage as uſual. In rolling up, the beſt Method will be to place the beginning of the Roller upon the *Fundus* of the *Fiſtula*, or at leaſt to make your Faſtening tight upon that Part: This will direct the contained Matter towards the opening, and the bottom will heal before the reſt of the *Sinus*. This happens beſt in *Fiſtulæ* of the upper or lower Extremities, eſpecially if the *Fundus* is in the upper Part of the Limb and the opening in the lower Part.

How deep *Fiſtulæ* are to be treated.

III. When *Fiſtulæ* penetrate ſo deep that you cannot come at the bottom of them with your Dreſſings, you muſt inject ſuch ſort of Liquors as we adviſed in the foregoing Chapter, you may alſo very properly add the following:

[a] See FABRIC. AB AQUAPENDENTE, MARCHETTI, and a Treatiſe by ASTRUC, who treat fully and judiciouſly on *Fiſtulæ* of the *Anus*.

[b] In *England* we call this Caſe a *Sinus*, never a *Fiſtula* till it becomes callous.

℞ *Ung.*

℞ *Ung. Digeſtiv. ex Terebinth. & Vitell. Ovi parat.* ℥j ß. *Mell. Vulgar. vel Roſar. vel Chelidon.* ℥j. *Spirit. Vini Vulgar.* ℥ix. *M. Vel,*

℞ *Decoct. Scord. vel Abroton. vel Agrimon.* ℥viij. *Spirit. Vini Simpl.* ℥iij. *Elixir Proprietat. vel Eſſent. Myrrh. & Aloes* ℥j. *Mell. Roſar.* ℥ij. *M.*

Theſe are to be injected at every Dreſſing, and the Opening of the *Fiſtula* ſhould be kept cloſe that the Medicine may be retained as long as poſſible, which will haſten the Agglutination of the Part; afterwards you are to proceed as we directed above treating of *Ulcers*, *Chap.* I. §. 13, and the following.

Seldom cured without the Knife.

IV. If the Method of Cure which we have hitherto deſcribed, is unequal to the Intention of cleanſing and healing, you will find greater Aſſiſtance from the Kniſe than from any other Remedy, and that chiefly where the *Fiſtula* tends downwards, or takes a very irregular Courſe, ſo that the *Fundus* of it cannot be preſſed toward the opening; in this Caſe you muſt lay open to the bottom.

Inciſion how to be made.

V. You ſhould gently paſs a grooved Probe or Director down the *Fiſtula*, and directing the Kniſe down the Groove, lay open the Fleſh and common Integuments as far as you think ſafe and neceſſary. All the *Sinus's* of the *Fiſtula* being laid open, a free Paſſage is made for a Diſcharge of the corrupted Matter, and you can come at the diſeaſed Parts with your Remedies. This Operation may be performed without the Uſe of a Director, if your Kniſe has a Button at the Point. (See *Plate* V. *Fig.* 4, and 5.) Some divide the Fleſh with a *ſtrong Pair of crooked Sciſſors.* (*Plate* I. *Fig.* D.) But this Method of cutting is attended with far greater Pain and Inconveniency than the other, except the Skin and Fleſh are exceeding thin.

What to be done after the Operation.

VI. If the Operation is ſucceeded by a large Diſcharge of Blood, which frequently happens; at the firſt Dreſſing you muſt fill up the Wound with dry Lint, afterward you may dreſs with *Unguentum Digeſtivum cum Ægyptiaco, vel Præcipitato Mercurii Rubro* till the Wound is cleanſed, every thing elſe is to be done as we adviſed above, treating of recent Ulcers. The Method of treating *Callus*, *Caries*, and thoſe ſort of Diſorders which attend *Fiſtulæ*, ſhall be delivered ſeparately below. CELSUS *Book* VII. *Chap.* IV. upon *Fiſtulæ* in general, and particularly on the *Fiſtulæ Coſtarum, Ventris, & Ani*, deſerves a diligent Peruſal.

CHAP. III.

Of the Method of treating STUBBORN ULCERS.

Various Cauſes of Stubborn Ulcers.

I. HITHERTO we have treated of mild and well conditioned Ulcers; it follows that we now deſcribe Ulcers of a more malignant Nature, which will not admit of a Cure by any of the Methods we have hitherto laid down; from the Stubbornneſs of their Diſpoſition they are called in the Medical Schools, *Ulcera Dyſepulotica*, *Chirona*, *Cacoëthica*, *Rebellia*, *Contumacia*. No Man in his Senſes will deny that they have all their proper Cauſes to which they owe this bad Diſpoſition. Theſe malign Ulcers uſually appear in Subjects of a bad, ſcorbutical, cachectical, and hydropical Habit of Body; or where

where you have the Pox, a *Caries*, or *Callus*, where there is great Acrimony of Blood, or a Cancer at the bottom of the Caſe. Whoever expects to be attended with Succeſs in treating theſe Caſes, ſhould diligently ſearch out and extirpate, if poſſible, theſe Cauſes of the Diſorder: But this in moſt Caſes is ſo difficult that it will foil the moſt experienced Surgeon or Phyſician; nor will quackiſh Empirics get any Credit here, let them boaſt ever ſo long of the ſecret Virtues of their famous Plaſters and Unguents.

(1.) When there is a bad Habit of Body.

II. When you can diſcover nothing of a *Fiſtula*, *Callus*, *Caries*, putrid Fleſh, or of Worms concealed in the Ulcer, it owes its Obſtinacy to the bad Habit of the Paient, either from a Redundancy of a glutinous, acid, acrimonious, or bilious Quality in the Blood; or from ſome venereal Taint; or from Irregularity in Diet; or, in Women, from an Obſtruction of the menſtruous Diſcharge; in Men of the Hæmorrhoids. In order to correct this vitiated Habit of Body, you muſt not only have recourſe to internal Remedies, but muſt alſo inſiſt ſtrongly on a ſtrict Regularity in Diet. This is of ſo great Conſequence, that I have ſeen the worſt of Ulcers yield to a [a] proper Regimen of Diet, without the Uſe of one internal Remedy, only cleanſing them daily with proper Medicines, or dreſſing them with any common Ointment, Oil, or Balſam, covering the Dreſſing with any Plaſter in uſe, as the *Emplaſtrum Saturninum vel Diapompholygos*. With regard to eating and drinking, thoſe things which ſet lighteſt upon the Stomach ſhould be preferred, and ſhould be given in very ſmall Quantities at a time; for every thing that is too ſalt, acrimonious, acid, hard, or crude; all ſorts of Fat, Lard, or Swines Fleſh, every thing even of the lighteſt kind taken intemperately, muſt be looked upon as Poiſon in theſe Circumſtances. Perſons of a ſanguine Habit ſhould avoid warm things; thoſe of a phlegmatic cold Habit, cooling things; a proper Regimen or Abſtinence is very much aſſiſting in the Performance of the Cure, by attending diligently to the Application of proper external Remedies. Therefore the Ulcer ſhould be kept very clean, that the corrupt Matter, by lying long upon the Part may not get an additional Acrimony, and ſo occaſion the ſpreading of the Diſorder: After it is well cleanſed, it is to be dreſſed with *Unguentum Digeſtivum*, to which may be added, *Myrrha*, *Maſtiche*, *aut Colophonia*, or with a Decoction *ex Juglandis Foliis cum injecto pauco Saccharo*; or a Decoction of *Viride æris cum Vino*: In ſome Caſes, *Spiritus Vini Simplex*, *vel Aqua Calcis cum Linimentis immiſſa*, has great Power in healing and drying up Ulcers. If you diſcover any *Sinus's* or *Fiſtulæ*, they are to be laid open, and to be cleanſed afterwards in the manner we taught above, and to be healed with *Balſamum Peruvianum*, *Copaibæ*, *Sulphuris Terebinthinatum*, or with any other of this kind. Laſtly, if internal Remedies are not neglected, there is no doubt but that the very worſt of Ulcers may generally be cured.

(2.) Running Ulcers.

III. When theſe Stubborn Ulcers are accompanied with a large Diſcharge, there is reaſon to apprehend that the Blood abounds with too large a Quantity of thin acrimonious *Serum*; this cannot be drawn off more properly than by cathartic Medicines. Where the Strength will admit of it, your Intention may be executed by preſcribing Cathartics and Diuretics, to be repeated frequently, at the ſame time cautioning your Patient againſt drinking too freely. *Mille-*

[a] Amongſt many others, conſult DOLÆUS in his *Encyclopædia* upon this Subject.

pedes

pedes præparati, *Eſſentia Succini*, *Myrrhæ*, *Balſami Peruviani*, *Tinctura Tartari*, *Tinctura Antimonii tartariſata*, or any other Tinctures or balſamic Eſſences, of known Virtues for promoting the Secretion of Urine, are very properly preſcribed in this Caſe. Large and frequent Draughts of ſmall Liquors, which are frequently the Cauſes of theſe Diſorders, are diligently to be avoided; on the contrary, ſtrong Ale, old Wine is to be uſed, but ſparingly, for common Drink at Meals, but the Patient ſhould drink nothing between Meals. With regard to a proper Choice for Diet, thoſe Meats are beſt which have the feweſt Juices in them, and are moſt roaſted; Flummery, Calves Feet, and Calves Foot Jelly are very proper Diet. The external Medicines ſhould be thoſe that obtain the greateſt Reputation as Dryers; the principal of theſe are *Aqua Calcis*, *Lapis Calaminaris*, *Tutia præparata*, *Creta*, *Maſtiche*, *Thus*, *Colophonium*, *& Cinnabaris Nativa*. When you have ſprinkled any of theſe finely powdered upon the Ulcer, you are to lay over it the *Emplaſtrum Diapompholygos*, *Saturninum*, *vel de Lapide Calaminari*.

(3.) Phagedænic Ulcers.

IV. Ulcers which ſpread and corrode the neighbouring Parts, are in the Medical Schools called *Phagedænic Ulcers*, and betray a great degree of Acrimony in the Blood, which is to be temperated as much as poſſible by the Phyſician, by the Uſe of lenient Medicines: The principal amongſt theſe are *Decocta ex Rad. Chin. Sarſaparill. Symphyt. Polypod. Lignit. Scorzon. Lapath. acuti*, *Herb. Malv. Alth. Hyperic. Sanicul. Agrimon. Marrub. alb.* and the like. With regard to Diet, you may obſerve the Directions we gave above at §. 3. all ſeaſoned Meats are bad in this Caſe. The Patient will receive great Relief by taking a purging Medicine ſometimes with the Addition of ſome *Mercurius Dulcis:* This will not only leſſen the foul Diſcharge of the Ulcer, but will alſo deſtroy the Acrimony of the Blood and forward the Cure. The ſame external Remedies are to be uſed here as we recommended at §. 2, 3. and the Uſe of them is to be diligently obſerved till the Cure is perfected.

(4.) Cutaneous Ulcers.

V. *Cutaneous Ulcers* that attack the Skin of Adults as well as Infants, particularly about the Face, approach very near to the Nature of Phagedænic Ulcers; for they not only ariſe from an Acrimony in the Blood, but are apt alſo to ſpread abroad; therefore, in both theſe Caſes, thoſe Medicines will prove moſt effectual which keep open the Bowels, and ſoften the Acrimony of the Blood. (§. 3, and 4.) Adults in particular ſhould be adviſed to drink freely of what we call the Decoction of the Woods, or *Decoctum Radicis Lapathi acuti*, *aut Herbæ Fumariæ*. Either of theſe Decoctions ſhould be drank by the Patient to the Quantity of ℥viij. or ℥x. three or four times in a Day, as hot as he can bear it. The firſt Draught ſhould be taken in Bed, and a Sweating ſhould be endeavoured to be raiſed; to theſe you may very properly add *Eſſent. Fumariæ*, *Lignorum Succini*, *vel Tinctura Antimonii tartariſata ad guttas* xxx. *vel* xl. you may alſo preſcribe abſorbent Powders to be taken with theſe Decoctions, *ex Antimonio & Flor. Sulphur. parat.* a proper Regimen of Diet ſhould be ſtrictly obſerved in this Caſe. *In Infants Caſes who are yet at the Breaſt*, you ſhould preſcribe Medicines that will conſtantly keep the Body open, and alleviate the Acrimony of the Blood, and at the ſame time the Mother or Nurſe ſhould obſerve the Courſe we have preſcribed above, and be very exact in her Diet. With regard to external Application, you will receive great Benefit from *Oleum Tartari per Deliquium*, if you dip a Pencil or Feather into it, and dawb the Part three

three or four times every Day, either with this alone, or with the Addition of *Oleum Ovorum atque Ceræ*; over this you muſt lay a Plaſter, as the *Empl. Saturninum, vel de Minio, vel de Spermate Ceti cum Camphorâ*, to prevent Injuries from the external Air. If the whole Face ſhould be affected, which is frequently the Caſe in Infants, a Plaſter will be very improper, but you may make a Linen Maſk, ſuch as we deſcribed above, treating of Burns. You will find the Uſe of the following Medicines in this Caſe, by no means to be deſpiſed, *Ol. Philoſophorum cum Oleo Ovorum, nec non Aqua Calcis, vel & Aqua ex edulcoratione Antimonii Diaphoretici*; the Ulcer ſhould be daily waſhed and cleanſed with one of theſe. If you pleaſe, in the room of theſe you may anoint the ulcerated Parts with *Unguentum de Lithargyrio vel Diapompholyg. vel de Enulâ*, with which, in very ſtubborn Caſes, you may mix *Argenti Vivi vel Mercurii Præcipitati rubri portiuncula*. If theſe Ulcers are attended with a large and foul Diſcharge, it will be proper to ſprinkle them with ſome abſorbent or drying Powders, as *Pulv. Tutiæ, Lapid. Calaminar. Ceruſſa, Creta, &c. cum Cinnabari Nativâ, aut Præcipitato rubro miſt.* or you may work any of theſe up into an Ointment *cum Cremore Lactis*, and uſe it as ſuch.

(5.) Cancerous Ulcers.

VI. *Cancerous Ulcers* are the moſt grievous of all the corroſive kind. In theſe Caſes the ſame internal and external Remedies are to be uſed which we directed for the ulcerated Cancer; *(Book* IV. *Chap.* XVII. §. 12.) Nevertheleſs, according to the Opinion of that great Phyſician and Surgeon M. A. SEVERINUS, there is more to be expected from manual Operation than Medicine in this Caſe; for many have been cured by the Knife or actual Cautery where Medicine has availed nothing; but whenever you ſhall think it adviſeable to uſe the Knife or Cautery, remember that you go to the bottom, and leave no Part of the diſeaſed Matter behind you; if you ſhould, all your work would be in vain. Some preſcribe here an *Aqua Phagedænica* made in the following manner: ℞ *Aq. Calc. Viv.* ℔ j. *Mercurii Sublimati* ʒ ß. *M. aut hujus loco Mercurius Præcipitatus albus* ʒ j. *vel* ʒ j ß. which they apply upon Lint. Some make this ſtronger of the Sublimate, others add *Spiritus Vini* ʒ j. *vel* ʒ ij. In the room of the Sublimate I have frequently ſubſtituted with Succeſs *Mercurius Dulcis* mixed with *Aqua Calcis*, which is a much ſafer Method. Digeſtive Ointments are to be avoided in cancerous Ulcers as not only foreign to the Purpoſe, but extremely miſchievous.

(6.) Putrid and fetid Ulcers.

VII. When Ulcers are *putrid* or *fetid*, this Circumſtance ariſes either from the Patient's very bad Habit of Body, or from the Negligence or Unſkilfulneſs of the Surgeon; therefore it is the buſineſs of the Phyſician to correct the Habit, by the Adminiſtration of proper internal Remedies, and of the Surgeon to clean the Ulcer frequently, eſpecially if it is attended with intenſe Heat: For where Wounds are dreſſed and cleanſed but ſeldom, which muſt frequently happen in the Army after ſmart Engagements, where great Numbers are wounded, it can ſcarce happen but that the injured Parts will be annoyed with Heat, Putrifaction, or Worms. You cannot more readily prevent theſe Inconveniences, than by carefully dreſſing the Parts with *Unguentum Digeſtivum cum Ægyptiaco ſeu fuſco* WURTZII *permixtum*; *aut Aqua Phagedænica*; *aut Mercurius Præcipitatus Ruber, vel ſolus, vel cum Alumine uſto miſtus, vel cum Unguento Digeſtivo ſubactus*. Theſe Dreſſings are to be continued till the putrid Fleſh ſeparates and leaves the *Fundus* of the Ulcer with its own natural roſy Colour: Whilſt this is

doing, it will be proper to cover the Part with Lint dipped in Spirits of Wine, which is a very powerful Remedy againſt Putrifaction. When the putrid Parts are caſt off, you muſt proceed in Healing as you do in other Caſes. But the Surgeon ought always to take care in this Caſe to call in a ſkilful Phyſician, who by proper Remedies may keep up his Patient, and preſerve him from ſinking before the Cure is perfected. Ulcers attended with Worms are to be treated in the ſame manner; for whatever prevents Putrifaction will deſtroy Worms.

Some Ulcers require Salivation.

VIII. Some Ulcers are ſo very malign and obſtinate, and notwithſtanding they have no Alliance with any venereal Taint, yet they will not yield to any of the foregoing Remedies. When this happens, the only Method of Cure is by adminiſtring mercurial Medicines, or raiſing a gentle Ptyaliſm, as I have frequently experienced. For ſome Mens Blood is ſo foul, that their Ulcers will not even be palliated, much leſs cured, without the Aſſiſtance of Mercury. But if they ſhould be attended with any Venereal Diſorders at the ſame time, the Uſe of Mercurials will then be abſolutely neceſſary, as we ſhall ſhew in the next Chapter.

CHAP. IV.

Of the Method of treating VENEREAL ULCERS.

Seat of Venereal Ulcers.

I. VENEREAL Ulcers, as we have already declared, are almoſt always ſituated in the *Inguina*, after the Suppuration of Venereal *Bubos*, or in the *Prepuce*, *Frænum*, or *Glans Penis*, which is uſually termed a *Chancre*; in Females they are frequently ſituated upon the *Vagina*, or *Labia Pudendi*. Sometimes the Noſe, Palate, Lips, *Fauces*, Tongue and *Uvula*; ſometimes the *Os Frontis* and other Bones both of the Head and other Parts are ſubject to them. If they are neglected or ill-treated, one Ulcer of this kind will produce an univerſal Pox. Therefore the principal Intention to be obſerved in this Caſe, is to expel the Venereal Poiſon by proper Remedies.

Internal Treatment.

II. The Cure by internal Medicine is to be performed by the Adminiſtration of purging Powders or Pills mixt with *Mercurius dulcis*. You may alſo adviſe your Patient at intermediate Times to drink Decoctions of the Woods, or to take *Eſſent. Lignorum*, *Pimpinell. alb. Succin. Tinctura Antimonii*, *&c.* in a proper Vehicle. Theſe Medicines have great Efficacy, if you take them before you riſe in the Morning, and encourage a moderate Sweat: A ſtrict Regimen to be obſerved in Diet, is very neceſſary. Wine, and all vinous or ſpirituous Liquors, Aromatics, Spices, Salt, acrimonious or acid Things are Poiſon in theſe Circumſtances. If the Diſorder has acquired ſo great a degree of Inveteracy, that theſe Medicines are not equal to the Cure, you muſt have recourſe to the ſtrongeſt Sudorifics, eſpecially to ſtrong Decoctions of the Woods; or you may give Mercury in ſuch Quantities as to raiſe a Salivation, by which you will cure both the Ulcers and the Pox, which was the Cauſe of them.

External Treatment.

III. Whenever the Ulcers are ſituated in the Mouth, *Uvula*, *Fauces*, Tonſils, or Tongue, external Remedies become neceſſary as well as internal. The Patient ſhould frequently uſe a Gargle, made *ex Decocto Lignorum, vel ſimplici, vel melle*

[a]On this Subject read *Aſtruc de Morbis Venereis.*

Roſarum temperato; the vitiated Part ſhould often be touched *vel Aquâ viridi* HARTMANII, *vel Roſarum melle cui ad lenem uſque acorem, Spiritûs Vitrioliſ. pauxillum inſtillatum eſt*; after this it is to be healed, *per Eſſent. Succini & Myrrhæ, vel per Oleum Myrrhæ per Deliquium*; if the Ulcers appear on external Parts, it will be proper to deſtroy them with *Unguentum Digeſtivum aut Baſilicon Mercurio vel vivo, vel albo aut rubro Præcipitato permixtum*; theſe Dreſſings are to be covered with the *Emplaſtrum de Ranis* VIGONIS, or with the *Diachylon cum Mercurio*; when the Ulcer is cleaned, you may dreſs with the Eſſences we adviſe above, or ſprinkle it with the abſorbent Powders we have ſo often recommended, (ſee *Chap.* I. N°. 15.) but you muſt add a ſmall Portion of red *Præcipitate*. An equal Power with the foregoing, in cleanſing and healing theſe Ulcers, is held by the *Aqua Phagedænica, vel Aqua Calcis Mercurio dulci imprægnata*. Either of theſe may be applied frequently every Day, touching the Parts ſometimes with the *Lapis Infernalis*. When the Ulcer is thoroughly cleaned, you may heal either after the Method recommended by HARRIS *in Diſſertat. Chirurg.* that is with a ſimple Ointment compoſed *ex Mercurio vivo cum Terebinth. q. ſ. ſubactum*: Or you may uſe the following *Formulæ*,

℞ *Ung. Mundificat. vel Diapompholyg. Merc. crud. pauca Terebinthin. extinct. ana* ℥j. *M. in Mortario vitreo.*

℞ *Amalgam. Mercur. & Stanni* ℥j. *Bol. Armen.* ℥ij. *Unguent. Roſat. q. ſ. M. f. Ung.*

If at the ſame time you have a *Caries* of the Bone, you are to treat it with the Remedies which we ſhall deſcribe below at *Chap.* VIII. particularly *cum Euphorbio vel Oleo Caryophyllorum, vel Aquâ Phagedænicâ, vel Spiritu Nitri, in quo Mercurius ſolutus fuerit*; or laſtly, if you can do it with Safety, apply the actual Cautery: Sometimes, when the Ulcers fall upon the ſoft Parts of the Body, particularly on the *Inguina*, they ſpue out ſuch large Quantities of Lymph, that all the Medicines you can invent, for cleanſing or drying them up, will avail nothing; this is occaſioned by the Rupture or Eroſion of ſome lymphatic Veſſels; in this Caſe we ſhould try what we can do by the Application of proper [a] Compreſſes and a tight Bandage; but if theſe afford you no Aſſiſtance, you muſt call the actual Cautery in aid, and apply it frequently, with caution, to the vitiated Parts.

Venereal Ulcers attended with great Danger.

IV. If Venereal Ulcers of the *Penis* or its *Glans*, are negligently treated, an univerſal Pox will frequently be the Conſequence, the *Urethra* will often be perforated in various Places, and the Urine be diſcharged as through a Sieve. Sometimes the whole *Glans* and *Penis* will be eaten off, or ſo miſerably afflicted with *Scirrhus* and [b] *Cancer*, that you will be forced to extirpate them with the Knife. When the Noſe is affected with theſe Ulcers, it is frequently demoliſhed by them; the Diſorder in this Part is called *Ozæna*, of which we ſhall treat more fully when we come to deſcribe *Chirurgical Operations*. Sometimes the Palate with its Bones are ſo eroded and perforated, that an open Communication is made between the Mouth and Noſtrils, that the fluid Part of our Aliment makes its way out at the Noſe. Theſe Paſſages can ſcarcely ever be cloſed again, eſpecially if they are large; but when the Extremities of them are healed, they may be cloſed

[a] In this I have followed RUYSCH, *Obſ. Chirur.* 41. with Succeſs.

[b] Conſult RUYSCH, *Obſ.* 30. & DOEBEL, *Hiſt. Penis Canceroſi.*

with

with a ſmall [a] Plate of Silver or Gold. The Tonſils, the external Coat of the *Uvula*, and the whole *Uvula* are very frequently deſtroyed by the Virulency of theſe Ulcers. Decoctions of the Woods and Mercurials are the principal Antidotes to this Poiſon. Laſtly, the *Cranium* itſelf, particularly on the Frontal Bone, is frequently, as I have often ſeen, ſo eroded and perforated by a *Caries*, that the Brain lays bare, and you may plainly ſee the Pulſations of the Arteries, from whence ariſe grievous Symptoms, and frequently Death, unleſs timely prevented by a proper Method of Cure.

CHAP. V.

Of CALLOUS ULCERS.

I. THE Cure of a *callous* Ulcer is attended with great Difficulty, to ſay the Truth, it will admit of no Cure till the *Callus* is extirpated. A *Callus* may be extirpated three Ways: The mildeſt Method which is to be uſed to a recent *Callus*, that is not yet become very hard, is performed by *corroſive Medicines*, and thoſe of the mildeſt kind; amongſt many others you may uſe *Alumen uſtum*, *Præcipitat. rub.* either ſeparately or mixt in equal Proportions, or made up with *Unguentum Digeſtivum* or *Baſilicon*: The *Unguentum Ægyptiacum ſeu fuſcum* WURTZII will anſwer this Intention, eſpecially if you add a little *Præcipitatum rubrum* to it. If the *Callus* does not yield to theſe Applications, you may deſtroy it with *Lapis Infernalis* or *Butyrum Antimonii*. The ſame End is alſo well anſwered by the Medicine which is made by a Solution of *Argentum vivum in Spiritu Nitri vel Aquâ forti*. A recent *Callus* how to be treated.

II. LE DRAN has taught us a ſtill milder Method of deſtroying Calloſities, *in Obſervat. Chirurg.* N°. 115. Tom. II. which is as follows: For four or five Days he applies a Plaſter, made *ex Emplaſtro Diachyl. cum Gummis & Vigonis cum quadruplici Mercurio, æquis partibus miſtis*; and this he renews Morning and Night, in order to ſoften the callous Lips in ſome Meaſure: After this he makes frequent Inciſions that paſs ſo deep as to penetrate through the whole Thickneſs of the *Callus*, and ſtops the Blood that ſucceeds theſe Inciſions with dry Lint; then he applies the ſame Plaſter again to the Ulcer, ſo that it may touch the naked inciſed Lips; after about four Days he repeated the *Scarifications*, and this to a third or fourth time, if it is neceſſary, that is if they are not deſtroyed before. By this Method he affirms that Calloſities by degrees give way, and a Cicatrix will ſucceed, without the uſe of any other Remedy. I have not yet had an Opportunity of experiencing this myſelf. LE DRAN's Method.

III. If *callous* Ulcers are accompanied with *Fiſtulæ*, then the *Sinus* muſt be laid open before we attempt to deſtroy the *Callus*, as we adviſed above when we treated profeſſedly on *Fiſtulæ*; after this, the *Callus* is to be conſumed in the ſame manner as we directed above: But if we ſhall think the Uſe of the Knife unſafe, or if the Patient will not admit it, it will be proper to form Tents, and daub them with *Unguentum Ægyptiacum vel fuſcum* WURTZII, and thruſt them up the *Sinus*; by this Method a *Callus* that is not of long ſtanding may When *Fiſtulæ* are accompanied with *Callus*.

[a] See Part II. Operat. on the Palate.

be deſtroyed, eſpecially if you dip the End of the Tent in *Præcipitat. rub. Lapid. Infernal. vel Butyr. Antimonii*, before you paſs it up the *Sinus*; and continue this Method till the *Callus* is deſtroyed. But when you cannot reach the *Callus* with the corroſive End of the Tent, you may uſe the following Method; you may inject *Aqua Phagedænica*, or a Solution of *Ung. Ægyptiacum aut fuſcum* WURTZII *in Spiritu Vini*, up the *Sinus*, and cloſing the Opening, confine it as long as you can conveniently, and repeat it as you ſhall ſee Occaſion. When you have removed the *Callus*, the Ulcer may be cured in the manner we have directed above *Chap.* II.

When the *Callus* is hard.

IV. Sometimes you will be obliged to uſe the Knife, as in *callous Ulcers* or *Fiſtulæ*, that are of long ſtanding, and have formed Variety of *Sinuſes*, where you can do nothing with corroſive Medicines; or where they affect and corrode the Nerves, and bring on violent Convulſions, before they affect the *Callus*. In this Caſe, the ſafeſt way is to lay open the *Fiſtula* in the manner we deſcribed above (*Chap.* II. N°. 5.) taking great care not to wound Nerves, Tendons, or Arteries. When you have laid open the *Sinuſes* of the *Fiſtula*, you may preſently deſtroy all the *Callous* Bodies, either by the Uſe of Corroſives, or by LE DRAN's Method; healing the Ulcer afterwards in the manner we have already adviſed.

How a very bad *callous* Ulcer is to be treated.

V. Laſtly, if even this Method of Treatment ſhall not anſwer the deſired End, if the Patient is well ſtocked with Strength and Courage, if the Situation of the Nerves and Arteries is favourable, you may cut out all the *callous* Parts with your Knife, or deſtroy them with the actual Cautery. This Operation, though attended with great Pain, will bring the moſt obſtinate *callous* Ulcer to the State of a recent Wound; unleſs a *Caries*, bad Habit of Body, Pox, Scurvy, Dropſy, or ſome other conſtitutional Complaint is in the Way, it may be cured by the moſt common Remedies. Therefore there is no reaſon why we ſhould fall into Admiration at, or doubt the Veracity of, M. A. SEVERINUS, when he affirms that he has happily ſucceeded in the Cure of the moſt deſperate Ulcers, by this Method.

CHAP. VI.

Of ULCERS *ſuppoſed to be produced by Magic or Witchcraft.*

Medicine foreign to this Caſe.

I. THE Remedies that PARACELSUS, HELMONT, AGRICOLA, and many others have with great Induſtry invented to cure Ulcers which are the effect of Magic, and always contain ſomething unnatural in them, as Thread, Nails, Needles, are entirely uſeleſs, and therefore ridiculous and abſurd. But if any are to be preferred to the reſt, we ſhould give the firſt Place to the following Remedies; *Folia Quernea, aut Salignea, Adianthum, Hypericum vel Fuga Dæmonum, Mercurius vivus, Aſa Fætida*. Theſe are hung round the Neck, or applied in ſome idle manner, ſo that they can do no Miſchief. Some preſcribe the Aſhes of a Witch that has been burnt, others burn *Stercus Humanum* and ſprinkle the Ulcer with the Aſhes. HEERIUS and HORSTIUS are high in the Commendations of *Unguentum de Viſco Corylino* CARICHTERI: MYNSICHT preſcribes his *Emplaſtrum Fætidum*; others other Remedies of equal Efficacy.

II. Thoſe Phyſicians who conſult their own Reputation, and the Health of their miſerable Patients, ſhall I ſay, or infatuated Patients, will preſcribe natural Remedies, ſuch as are beſt ſuited to the Nature of the Ulcer, and the Patient's Habit of Body, as we have taught in the foregoing Chapters. For although we ſhould make ever ſo large Conceſſions, concerning the Power which Devils and Sorcerers are by ſome ſuppoſed to have over Men, yet we ſhould never be juſtified in aſſerting that Diſorders thus produced were not to be treated by natural Remedies, but that we ought to have recourſe to ſuperſtitions, naſty and ridiculous Methods of Cure; to ſay the Truth, thoſe Ulcers are uſually affirmed to be the Effect of Magic, by unſkilful and ſuperſtitious Barbers and Medicaſters, which evade their Art, though at the ſame time they are eaſily to be cured by an experienced Surgeon, who can thoroughly inveſtigate the true Cauſe and Nature of the Diſorder. There have been even amongſt the Surgeons ill-minded Men, who have falſely affirmed Ulcers to be the Effect of Magic, in order to enhance the Price of the Cure. What is to be done.

CHAP. VII.

The Method of treating old Ulcers, eſpecially thoſe that affect the Legs.

I. ALTHOUGH there is ſcarce any Part of the Body free from inveterate and obſtinate Ulcers; yet the Legs are found to be much more ſubject to them than the reſt. As we before (*Chap.* III.) treated of malignant and inveterate Ulcers in general, we ſhall here only conſider thoſe which are ſeated in the Legs, or lower Extremities. But the general Cauſes of obſtinate Ulcers in the Legs are almoſt always the ſame with thoſe of malignant Ulcers in general; for theſe, like the former, uſually ariſe either from a bad Habit of Body, too great Thinneſs or Acrimony in the Juices, or from being attended with Calloſity, and *Caries* of a Bone; or laſtly, from the Obſtruction of ſome uſual Evacuation, as of the *Menſes* in Women, or from other Cauſes of the like Nature. In order therefore to remedy theſe Ulcers, the Surgeon ſhould give a particular Attention to their Cauſes, that he may be thereby led to a rational Treatment of them. In what the Cure chiefly conſiſts.

II. Before we enter into an Enquiry, after what are the moſt likely Means to be uſed to cure theſe Ulcers, it will not be amiſs to examine, Whether they can be healed without Danger to the Patient? For we are furniſhed with frequent Examples in the Writings of Phyſicians of the greateſt Experience, where the worſt of Diſorders, and even Death itſelf, has been the Conſequence of healing theſe Ulcers. The Anſwer to this Queſtion, if I am not miſtaken, is very clear, from what I have delivered above, (in *Chap.* I. N°. 9.) to wit, in Perſons advanced in Years, or labouring under an infirm Habit of Body, it is moſt adviſeable not to attempt to heal them; ſince they are in this Caſe to be looked upon rather as a Relief of Nature than as a Diſorder, as they ſerve to drain off all noxious Humours from the Body. But I would not have this Rule extended to young robuſt Subjects, without ſome very material reaſon. For in theſe the firſt Cauſe of ſtubborn Ulcers may be removed by Abſtinence or a regular way of Living, by opening Fontanells, or by proper internal Remedies, without any Danger; and the Cauſe being removed, the Ulcer may be healed with great Safety. Whether Ulcers in the Legs may ſafely be healed.

III. Al-

What is to be obſerved in general, in old Ulcers.

III. Although we have declared above, that it is improper to heal inveterate Ulcers in old Subjects; yet I am very far from affirming that no Care at all ſhould be taken of them; on the contrary, I think it abſolutely neceſſary that they ſhould be attended to. The Surgeon is to obſerve two things in this Caſe: Firſt, to relieve the Pain, and other violent Symptoms; next, to prevent the Ulcer from ſpreading, and new Symptoms from coming on.

Internal Remedies.

IV. In the firſt place, Abſtinence and a ſtrict Regimen in Diet is to be obſerved. Gentle Purges are to be frequently repeated, to carry off the redundant Humours by Stools. Internal Medicines are alſo to be preſcribed, ſuch as are moſt likely to remove the Cauſe of the Ulcer. In Perſons advanced in Years, balſamic and bitter Medicines are proper, ſuch as *Elixir Proprietatis*, *Eſſent. Myrrh.* *Eſſent. Succini*, *Eſſent. Balſami Peruviani*, and others.

External Remedies.

V. With regard to the external Treatment of the Ulcer, care muſt be taken that it be cleaned from its *Sanies*, once or twice every Day; you may then dreſs it either with dry Lint, or with Lint dipt in *Decoct. Fol. nucis Juglandis vel Ariſtolochiæ*, over this you may lay the *Emplaſtrum ad Ulcera antiqua* BAUHINI, *Diaſulphuris* RULANDI, *Diapompholygos*, *Saturninum*, *de Lapide Calaminari*, or any other of this kind. Theſe Rules being nicely complied with, there is no room to doubt but theſe Ulcers may become very mild, and convenient for the lengthening out the Life of the Patient. The Phyſicians amongſt the Ancients, obſerving the ſalutary Effects of Ulcers upon old Perſons, thought Nature to be the beſt Guide, and therefore opened Fontanells in many Caſes, which anſwer the End of Ulcers, in draining off the noxious and redundant Humours.

How Inflammation and Pain is to be treated.

VI. Whenever Inflammations and violent Pains come on, as they frequently do, either from a Blow, or Cold, or putting the Leg into cold Water; or from Paſſions of the Mind, or Irregularity in Diet; it will be proper in this Caſe to apply a linen Compreſs, dipt *in Aquâ Reginæ Hungariæ*, *vel Sp. Vini Theriacali*, *aut Camphorato*, *vel et Aquâ Calcis et Spiritu Vini Camphorato calidis*. The Patient ſhould keep his Bed, and defend the injured Limb as much as poſſible from Cold; and he ſhould be ordered to drink plentifully of ſmall Green Tea, White Wine Whey, or any other ſmall Liquors, that may be likely to promote a Sweat. By theſe means the Inflammation and Pain will quickly go off. But there is great Danger, eſpecially when the Patient is of a bad Habit of Body, when the Inflammation runs to a great Height, and begins to degenerate into a Gangrene; in this Caſe the ſame Remedies are to be uſed both internal and external, which we preſcribed above when we were treating of a Gangrene (*Book* VI. *Chap.* XIV. N°. 5. *and the following.*) But above all, in this Caſe you are to be very careful to keep up the Spirits of weak and aged Perſons with proper Remedies, and to provoke gentle breathing Sweats; if theſe Rules are neglected, there is very imminent Danger that *Sphacelus* and Death will by degrees ſteal upon you.

How to treat Ulcers that dry up ſpontaneouſly.

VII. When theſe Ulcers dry up ſpontaneouſly, in old and infirm Perſons, a Horror, Nauſea, and great Weakneſs uſually ſucceed, which declare Death to be at hand. (*Chap.* I. N°. 9.) The firſt Intention is to ſupport the remaining Strength of Nature as much as poſſible by proper Diet and Medicines: You ſhould inſtantly apply to the Ulcer *Radix Gentianæ*, *vel Iridis Florentinæ contrita*; or if theſe ſhall be thought of too little Force, *Radix Hellebori nigri in Pulverem aut Globulos redacta*; or laſtly, *Pulvis Cantharidum*, *aut Globulus ex Em-*

plaſtro Veſicatorio Officinarum. Theſe Applications will produce ſo great a Stimulus, that the Ulcer will frequently run again to the great Relief of the Patient; when this happens you muſt treat it as before: But when it reſiſts all Remedy, and ſtill continues dry, you have no Hopes of Life remaining.

CHAP. VIII.

Of CARIES *of the Bones.*

THE *Caries* or Corruption of the Bone may very juſtly be eſteemed one of the principal Cauſes of the Depravity and Inveteracy of Ulcers. For you will find it ſcarce practicable to heal an Ulcer; or if you do bring it to heal, it will not remain long in that State, where you have a *carious* Bone concealed at the Bottom.

II. We call that Diſorder of the Bone a *Caries*, where the Bone, from whatſoever Cauſe it ſhall proceed, is deprived of its Covering, or *Perioſteum*, and having loſt its natural Heat and Colour, becomes fatty, yellow, brown, and at length black. This is the firſt and lighteſt degree of this Diſorder, and is called by the Ancients, according to CELSUS *Lib.* VIII. *Cap.* 2. *Os Vitiatum* and *Nigrities*; but the greater degree of this Diſorder is, when the Bone is eroded and eaten, and becomes uneven from the Number of ſmall Holes of which it is full: When it diſcharges a filthy *Sanies*, whoſe Acrimony ſoftens, relaxes, and deſtroys the fleſhy Parts that grow round it; this is a true *Caries*, or *Ulcer of the Bone*, and every Bone in the Body is ſubject to this Diſorder. And although this Ulcer may ſometimes appear to be very happily healed, yet after the Cicatrix has been brought on for ſome time, you have an Abſceſs formed, the Diſorder will return afreſh, and the acrimonious corrupted Matter which continually ſpues out from the *carious* Bone, being collected within, will produce various grievous Symptoms, ſuch as Shivering, Vomiting, and Fever, and deſtroy the neighbouring Fleſh again. *A Caries what.*

III. There are many Names and Species reckoned of this Diſorder, and of others that bear a near Relation to it; for it is called a *Caries*, [a] *Spina Ventoſa* or *Spinæ Ventoſitas*, a *Gangrene* and *Cancer* of the Bone by [b] CELSUS, ſometimes by the *Greek* Term [c] *Teredo*, and ſometimes *Pædarthrocaces* [d]. Though ſome Authors conſtitute as many diſtinct Species of a *Caries*, as we have reckoned up Names, yet I think there is not ſo material a Difference between them, that we ſhould multiply them into ſo many ſeparate Species. Therefore I think it beſt to diſtinguiſh them into two Sorts; the firſt where the Diſorder begins in the internal Part of the Bone, the other begins on the outſide or from an external Cauſe. I would call this a *Caries*, and that a *Spina Ventoſa*; or when it happens in Children, I would comply with SEVERINUS, and call it *Pædarthrocaces*. But of theſe we ſhall preſently treat more fully, in a particular Chapter for that Purpoſe, and explain their Differences more accurately. *Different Denominations.*

[a] We have a Treatiſe on the *Spina Ventoſa* by PANDOLPHINUS an *Italian*, republiſhed with the learned Notes of MERCKLINUS, *Norimberg*, 1674. 12mo. [b] See the Book laſt cited, *p.* 258. [c] *Ibid.* pag. 64, 104, 143, 264, and the following. [d] M. A. SEVERINUS treats on this Subject in his Book *de Abſceſſibus*, and there are ſeveral *Academical Theſes* on this Head, by different Authors.

IV. We

Cauſes. IV. We find two Cauſes of the [a] *Caries* of the Bone. For 1. A *Caries* ariſes, when the Bone is deprived of its *Perioſteum*, by a Wound, Fracture, Bruiſe, or any other Accident, and either is expoſed to the Injuries of the external Air, or is corrupted by greaſy Dreſſings, or the common vulnerary Oils which are uſually applied to ſimple Wounds, ſuch as *Oleum Hyperici*, *Lilior. albor. Balſamum Samaritanum*, *&c.* Or, 2. A *Caries* ariſes when the Fluids are interrupted in their Circulation, by any external Violence, or internal Cauſe whatſoever, from whence Inflammation and Suppuration ſucceed, by which the *Perioſteum* and Bone ſuffer to ſuch a degree, that the Veſſels which are ſent to theſe Parts for the Nouriſhment and Support of the Bone and *Perioſteum*, being inflamed and corrupted, the Bone is brought into conſent, and quickly becomes *carious*. This Diſorder, if not quickly remedied, ſpreads and communicates itſelf to the neighbouring Parts of the Bone, making the ſame Progreſs with Ulcers in the ſoft Parts.

V. From whence it evidently appears, that there are ſeveral Degrees of Eroſion or *Caries* of the Bone. The firſt and mildeſt Degree is when the Bone is laid bare, looks greaſy, and turns yellowiſh. But aſſoon as it becomes truly yellow, brown, or black, the incipient *Caries* degenerates into a worſe State. The third Degree is, when the Bone becomes uneven, rough, and rotten. The greater Eroſion the Bones have ſuffered, the more rough and uneven will they appear. When the *Cranium* is perforated through both Tables, or the *Tibia* or *Femur* are eaten through to the *Medulla*, this is a *Caries* of a very bad kind. But the worſt kind of *Caries*, where indeed the Caſe may almoſt be pronounced deſperate, is that which falls upon the Joints, or any Parts of the Bones that lay deep, becauſe you can have no Acceſs to it with your Hands, to clean the Bone, and the Caſe admits of no Remedy but Amputation of the Limb.

Diagnoſis. VI. A *Caries* may be diſcovered two ways, as it is concealed, or as the diſeaſed Bones are expoſed to View. 1. When the Bones lay open to the Sight, the *Caries* diſcovers itſelf by the following Signs: The Bone looks greaſy, and degenerates from its natural Colour, to yellow, brown, or black; the Bone is bare, and the *Perioſteum* deſtroyed; if you apply your Finger or Probe to the Bone, it will diſcover itſelf to be rough, uneven, and ſpongy. 2. But where the Bone is covered with Fleſh, it will then diſcover itſelf by the following Signs; the Matter that flows from it will appear greaſy, brown or blackiſh, and ſtink like rank Lard. When you take off the Dreſſings, they will be tinged with a blackiſh Hue, from the Colour of the Diſcharge; when you have room to paſs your Probe to the Bone (which is not always the Caſe) you will find it to be rough and uneven. The neighbouring Fleſh will appear flaccid, ſoft, looſe, ſpongy, and ſtink like rank Lard. Laſtly, in Caſes where you can neither ſee the Bone, nor get at it with your Probe, you may very reaſonably ſuſpect it a foul Bone, when the Ulcer frequently breaks out afreſh, after it has been healed, without any other manifeſt Cauſe.

Prognoſis. VII. From what has been laid down, it plainly appears, what Dangers the *Caries* is attended with, and what Event we may expect from each different Degree of it. Ulcers of this kind give great Trouble in healing; they are very apt to ſpread, eſpecially where we cannot conveniently come at the *Caries* to

[a] HEYNE, in his Book *de Oſſium Morbis*, treats ingeniouſly on the Formation and Cauſes of a *Caries*.

deſtroy

deſtroy it; when they are healed they frequently break out again, as was juſt obſerved. Where the Diſorder encreaſes, and extends itſelf to the Joints, particularly to the Knee, there is ſcarce any Remedy, but Amputation of the Limb; where the Circumſtances are ſuch, that it ſhall not be thought adviſeable to take off the Limb, the Patient is followed with great Weakneſs and a feveriſh Diſorder, and by degrees with Death. *Caries* in the *Femur*, *Coccyx*, *Os Sacrum*, *Carpus*, *Tarſus*, and *Oſſa Palati* meet with extreme Difficulty in the Cure. When the *Cranium* is affected with this Diſorder, it is frequently eat through even to the *Dura Mater:* From whence proceed acute Pains of the Head, great Watchfulneſs, Vertigo, a diſturbed Imagination, and many other Diſorders of that kind, with great Danger of Death.

VIII. With regard to the Cure of a *Caries*, many Methods have been attempted. [a] The firſt and mildeſt Method is applied to the ſlighteſt degree of a *Caries*, and is performed by the Application of Spirituous Remedies, ſuch as *Spiritus Vini*, *Aqua* REGINÆ HUNGARIÆ, with which Applications alone, I have cured ſlight *Caries:* Or by Balſamics, ſuch are *Pulv. Ariſtolochiæ, atque Iridis Florentinæ, vel Pulv. Myrrhæ atque Aloës.* One of theſe Powders is to be ſprinkled upon the Part, after you have diligently wiped away the *Sanies* with dry Lint; this Method is to be continued till the diſeaſed Part of the Bone is caſt off, and new ſound Fleſh ſprings up in its ſtead. In a *Caries* that penetrates ſomewhat deeper, ſtronger Remedies take place; ſuch as [b] *Pulv. Euphorbii, vel Eſſentia Euphorbii, cum Spirtu Vini optimo parato, vel Oleum Caryophyllorum, Cinamomi aut Ligni Guaiaci.* Theſe may be applied with a Pencil, or ſpread upon Lint, and laid on the Part affected; others apply corroſive Medicines, as the *Aqua Phagedænica, aut Spiritus Vitrioli aut Sulphuris*, and with the ſame Succeſs; in the room of all theſe you may very well ſubſtitute, *Solutio Mercurii in Aquâ Forti vel Spiritu Nitri.* We have enumerated theſe as the principal, from a great many other Remedies of the like Nature, that have been preſcribed for the ſame end. We purpoſely paſs by ſuch as are either too weak for the Intention, or too vehement to be admitted with Safety; ſuch as *Arſenicum vel Mercurius Sublimatus* in ſubſtance. When you have procured an Exfoliation of the diſeaſed Part of the Bone, your Buſineſs is to complete the Cure with Balſamics; therefore the next Dreſſings to take place, are *Aqua Reginæ Hungar. Eſſentia Maſtich. Myrrhæ, Succini Aloës, Balſamum Peruvianum vel Capivi*, or any Balſams of this kind, covering theſe with a Plaſter, and proceed afterwards as you was directed above in the Cure of Ulcers in general (*Chap.* I. N°. I. *and the following.*) LE DRAN has given us Obſervations on *Caries* of the Bones very well worth our remarking, particularly on a *Caries* of the Cubit, *Obſ.* 51, 52, 53. in the Loins, *Obſ.* 69. after the Small-Pox, *Obſ.* 70. in the *Os Ileum*, *Obſ.* 95. in the *Trochanter major*, *Obſ.* 97. in the Knee, *Obſ.* 102, 103. and in the *Tibia*, *Obſ.* 104.

Cure 1. By Medicine.

IX. A ſecond Method of Cure for a greater degree of *Caries*, conſiſts in [c] perforating the Bone after it is laid bare, with the Trepan or Inſtrument deſcribed in *Plate* VII. *Fig.* 2. *or Fig.* 7. A. *or Plate* XV. *Fig.* 8. in the ſame

2. By the Trepan.

[a] The Ancients uſed the Cautery or Raſp in the ſlighteſt Caſes, as you may ſee in CELSUS, *Lib.* VIII. *Cap.* 2. but at preſent we never uſe theſe violent Methods, but in deſperate Caſes.

[b] This is highly extolled by many. See MERCKLINI *Lib. de Spinæ ventoſitate*, pag. 473.

[c] See the Method of perforating by CELSUS, *Lib.* VIII. *cap.* 2, and 3.

manner, as we adviſed in another Place to be done with the *Cranium*, after it had been laid bare by a Wound, *Book* I. *Chap.* XIV. N°. 17. After this is done, the Part is to be dreſſed either with dry Lint, or with the balſamic Medicines which we have recommended above. By theſe means the Exfoliation of the foul Bone is forwarded, and new Veſſels puſh through the *Foraminula* that you have made, which joining with the neighbouring Fleſh, make a new Covering for the Bone.

3. By the *Raſpatory* or Chiſſel.

X. The third Method of Cure is performed by ſcraping away the diſcoloured or vitiated Part of the Bone, with a *Raſpatory* or Chiſſel (*Plate* VII. *Fig.* 3, 4, 5.) till all the corrupted Parts being deſtroyed, the Bone appears white or ruddy and ſound. CELSUS adviſes this Operation of raſping the Bone, to be done boldly and expeditiouſly.[a] SCULTETUS is of Opinion, that you ſhould never begin to ſcrape, till the Bone lays fairly expoſed, or rather not till it begins to ſeparate from the ſound Parts, and that you ſhould dreſs the Part with nothing but dry Lint, till this happens; but this Rule is not conſtantly to be obſerved: Others in particular Caſes uſe a Chiſſel and Mallet (*Plate* VII. *Fig.* 10, 11.) by the Aſſiſtance of which they ſtrike off the corrupted Parts from the ſound; but both theſe Methods N°. IX. and N°. X. have been pretty much neglected by the modern Surgeons. Though PETIT affirms, in his Book *de Morbis Oſſium*, when he is treating of a *Caries*, that where you have fungous Fleſh continually ſprouting up, the beſt Method is to raſp the Bone, and afterwards to uſe the Cautery. In certain Tumors of the Bone which are called by us *Spinæ Ventoſæ*, which refuſe to yield to any medical Application, he adviſes not only to make frequent Perforations, but to take off the Tumors with the Chiſſel and Mallet: But we ſhall treat of this Caſe in the following Chapter.

4. By the Cautery.

XI. The fourth, which is the moſt ancient, ready, and certain Method of Cure, eſpecially in the greater degrees of this Diſorder, is performed by burning down the vitiated Part of the Bone with the actual Cautery. See different Sizes and Figures of Cauteries in *Plate* III. Great Care muſt be taken in performing this Operation, that you do not injure the Fleſh or other ſoft Parts that lay near. To prevent miſchief of this kind, your Aſſiſtant ſhould keep back the Lips of the Ulcer with his Hands: If the Opening is too narrow, it ſhould be enlarged with a Sponge-tent, or widened by the Knife, till the Bone lays fair. The Bone itſelf ſhould be well cleaned with dry Lint, and if there is any fungous Fleſh, it ſhould be removed before you go to work with your Cautery. One Application of the Cautery will ſeldom be ſufficient for your Purpoſe, where the *Caries* is conſiderable; the Operation muſt be frequently repeated, at longer or ſhorter Intervals, as you ſhall think proper. If the *Caries* has ſpread itſelf ſo wide, that you cannot deſtroy it with one Cautery, the firſt Iron ſhould be applied to the Middle of it, proceeding afterwards to its Lips. This Operation is not attended with great Pain, if you take care not to hurt the ſoft Parts, for the Bones have no ſenſe of Pain. [b] When the Bones of the *Cranium* are become *carious*, a cautious Surgeon will never riſque his Reputation on this Operation, from the apparent Danger there is of injuring the Membranes of the Brain, or the Brain itſelf. The ſame Caution may be obſerved in ſome other ſoft and ſpongy Bones, as in the *Sternum*, or a *carious Rib*, where for the like

[a] In *Armament. Chirurg.* pag. 42.

[b] CELSUS has given the ſame Caution, *Lib.* VIII. *cap.* 2.

reaſons

reaſons the Cautery is to be avoided. The *Carpus* and *Tarſus* will not well admit of cauteriſing, and other ſpongy Bones of this kind; and that more particularly from the Neighbourhood of the Tendons and Ligaments, which will neceſſarily be in great Danger of ſuffering.

What is to be done after cauteriſing.

XII. When you have cauteriſed the Parts in the manner I have deſcribed, you ſhould dreſs at firſt with dry Lint; but if the Patient complains of a Senſe of Heat in the Part, you ſhould moiſten your Lint *cum Spiritu Vini:* But you may afterwards dreſs with Balſamics, ſuch as we deſcribed above at N°. VIII. till the Exfoliation ſucceeds; and the Vacuity will ſhortly be filled up with new ſound Fleſh, which will be a Teſtimony of the Recovery of the Part; but where it happens otherwiſe, and the Bone is left bare, uncovered with Fleſh, or if the Fleſh with which it is covered, is ſoft and ſpongy, and does not adhere ſufficiently to the ſubjacent Bone, or where the Bone remains diſcoloured, in either of theſe Caſes, your original Diſorder is not extirpated; in theſe Circumſtances your Work is to be done over again, the ſpongy Fleſh muſt be removed, either with the Knife or Cathæretics, ſuch as the *Alumen uſtum et Mercurius præcipitatus ruber*, or ſtronger if they ſhall be found neceſſary, and the actual Cautery muſt be again called for, or you cannot expect your Cure to ſtand.

When a *Caries* penetrates to the *Medulla*, the Trepan is ſometimes neceſſary.

XIII. When the *Caries* penetrates even to the *Medulla* in the larger Bones, [a] PETIT adviſes us, after the Example of [b] MEEKREMIUS, to make a Perforation, or two or more, in the Bone with the Trepan, and furniſhes us with an Inſtance where he made three Perforations in this manner, in the *Tibia*, after he had tried the Cautery, and was juſtified by Succeſs: But this Method can ſcarcely be put in Practice upon any other great Bone, than the *Tibia*, becauſe you will be obſtructed by the great Quantities of muſcular Fleſh which you will meet with. He further informs us, that the *Os Pectoris* or *Sternum* may be ſometimes perforated in this manner, to make a Paſſage for the Diſchagre of Matter, which is ſometimes confined under it, and to make way alſo for the immediate Application of Medicines to the diſordered Part: But the Performance of this Operation on the *Sternum* requires the greateſt Caution and Deliberation, becauſe Reſpiration may be injured by it, or other grievous Diſorders may be produced. It is to be obſerved in this Place, that the *Caries* of the Bone which penetrates to the *Medulla*, or begins in the *Medulla*, which we term the *Spina Ventoſa*, does not always ariſe from an internal Cauſe, but frequently from an external Violence, by which the Veſſels which are diſtributed on the internal Part of the Bone, are burſt, and Blood extravaſated, which by its Stagnation in the Cavity quickly forms *Pus*, erodes the Bones, and produces a *Caries*, which extends itſelf from the *Medulla* to the external Parts.

Admonitions of CELSUS.

XIV. When the Blackneſs or *Caries* extends to the other Side of the Bone, ſo that the whole Bone ſeems to be corrupted, CELSUS adviſes to take it entirely out, *Lib.* VIII. *cap.* 2, 3. If the lower Part remains ſound, you muſt remove only as much as is corrupted; if a Bone of the *Cranium*, or the *Os Pectoris*, or one of the *Coſtæ* is *carious*, the Cautery is not to be uſed, but it muſt be cut out; and in this no Delay is to be ſuffered, but you are to take it out the Inſtant you have laid it bare, before any inflammatory Symptoms come on, by which means you will do it with greater Safety. When a Cartilage is be-

[a] *Lib. de Morb. Oſſium, cap. de Carie.* [b] *Obſ. Med. Chirurg.* 72. *edit. Latinæ*, & 69. *Belgicæ.*

come *carious*, you muſt pare off the *carious* Parts with your Knife, according to CELSUS to whom I am obliged for this Section, not having met with any Modern Surgeon, who has treated ſo well on this Subject.

In what the Cure of a *Caries* conſiſts.

XV. Upon a diligent Attention to what has been delivered, we may very reaſonably conclude, that the principal Buſineſs in curing a *Caries* of the Bone, conſiſts in a ſpeedy Extirpation of the *Carious* Parts of the Bone; and this is done in very ſlight Caſes by the Application of *Spiritus Vini*, or *Aqua Reginæ Hungariæ*; in Caſes of more Conſequence, by a Solution of *Argentum Vivum in Aquâ Forti*; but in Caſes of the laſt Conſequence, by the Cautery or Knife; the reſt of the Cure is performed in the ſame manner as other Ulcers are treated, to wit, by the balſamic Remedies which we have ſo often recommended.

How Bones that are very rotten are to be treated.

XVI. Where the Bone is exceeding rotten, or where the Diſorder has communicated itſelf to the Joint, for Inſtance to the Knee, or to any Joint of the Arm or Leg, ſo that the vitiated Part cannot be extirpated, and the reſt of the Limb preſerved; you have only one Remedy left, and that a miſerable one, which is the Amputation of the diſeaſed Limb, otherwiſe your Patient will drag on a miſerable Life; and at laſt worn down with Pain and Weakneſs, attended with a long train of grievous Symptoms, will yield to Death. In the large Bones, where the whole Bone is not *carious*, but only part of it, as the external Part of the *Maxilla*, *Os Humeri*, *Tibia*, or *Clavicle*; or any Part of the *Rib*, *Ulna*, *Radius*, or *Fibula*, &c. you muſt not immediately proceed to the Amputation of the Limb, but only remove in the moſt convenient manner you can, either by medicinal Applications, or by the actual Cautery, the diſeaſed Part of the Bone, dreſſing afterwards as we taught above at *Sect.* 12. till the Bone is covered with ſound Fleſh, and the Ulcer healed. Sometimes part of the vitiated Bone ſeparates ſpontaneouſly from the reſt of the Bone: If you can lay hold of it, and the Ulcer is wide enough, you ſhould remove it with your Fingers or the Forceps: If the Ulcer is not wide enough to admit of this, you muſt enlarge it with your Knife. You will meet with a remarkable Caſe of this kind in MEEKREM, *Obſerv. Chirurgic.* 66. *Edition. Belgic. et Obſerv.* 69. *Edit. Latinæ*, where a large Portion of foul Bone ſeparated and caſt off from the Arm; and another in RUYSCH, *Obſervat.* p. 94. *ac Theſaur. Anatomic.* VIII. *Tab.* III. where the ſame Caſe happened in the *Tibia*.

CHAP. IX.

Of the Spina Ventoſa, Pædarthrocaces, and Exoſtoſis, which may be called Tumors of the Bones.

Spina Ventoſa what?

I. THAT Species of Corruption of the Bones, which takes its Riſe in their internal Parts, and by degrees enlarges the Bone, and raiſes it into a Tumor, is at this time called by Phyſicians and Surgeons a *Spina Ventoſa*, by ſome [a] *Spinæ Ventoſitas*; though the Ancients were entire Strangers to theſe Terms, and diſtinguiſhed them by the Names of *Sideratio*, *Gangræna*, or *Cancer Oſſis*, or ſometimes by the Word *Teredo*. Some amongſt the *French* call it an

[a] By the *Arabians*, witneſs Jos. PANDOLPHINUS *Lib. de Ventoſitate Spinæ*.

Exoſtoſis,

Exoſtoſis [a], though this Term more properly belongs to certain [b] Eminences or preternatural acuminated Excreſcences in the Bones, which happen after a Fracture or other Accident, and are ſometimes accompanied with a *Caries*: Though I have frequently ſeen this Caſe of the Bones, and have now Bones of this kind in my Collection, where there is not the leaſt Appearance of *Caries*. This Diſorder ſeems to have borrowed the Term *Spina* from the Reſemblance which the Eminences of the Bone in this Caſe bear to Thorns, continually pricking the Fleſh, and producing grievous Pains; and the Epithet *Ventoſa* is added, becauſe the Tumor appears, upon touching, to be filled with Wind or Air, though in Fact it is never, or [c] very ſeldom diſtended with Air. Afterwards ſeveral Writers, and particularly PANDOLPHINUS, barbarouſly diſtorted the Word into *Spinæ Ventoſitas*.

II. When this Diſorder happens to Children, many, with M. A. SEVERINUS, call it [d] *Pædarthrocaces*, from the Greek Words παῖς a Child, ἄρθρον, a Joint, and κακὸν an Evil; to ſignify that this Diſorder is moſt frequently found in the Joints of Children: For as the Bones of Children are ſofter and more ſpongy than the Bones of Adults and old Perſons, they are therefore ſo much the eaſier diſtended by Humours, and more frequently form [e] Tumors. SEVERINUS made another Diſtinction between the *Spina Ventoſa* and *Pædarthrocaces*. For ſome of theſe Tumors which we call *Spinæ Ventoſæ*, are very painful, frequently look red, and have all the Appearances of Inflammation; others are free from Pain (at leaſt in any conſiderable degree) in the Beginning, particularly in rickety Children, and theſe he called *Pædarthrocaces*; but at preſent theſe Names are pretty much confounded, and are deſervedly, as [f] MERCKLINUS has taught us, uſed for one and the ſame Diſorder, only with this Difference, that this Diſorder in Children begins with little or no Pain, but is almoſt always attended with Pain in its Progreſs. *Pædarthrocaces* what?

III. There are other Names of a *Caries*, which we have recited above, *Sect.* I. and in the foregoing Chapter, *Sect.* III. which agree much better with this Diſeaſe of the *Spina Ventoſa*, than with that Diſorder, which is vulgarly and ſtrictly ſpeaking called a *Caries*: As *Cancer Oſſis*, *Gangræna*, *Sphacelus Oſſis*, which Terms are frequently uſed by the Tranſlators of HIPPOCRATES; and the Greek Word [g] τερηδὼν which they tranſlate *Teredo*, from the Similitude of thoſe Worms which are called *Teredines*, which eat into and deſtroy Wood. It is very probable, that theſe are all ſynonymous Words for the *Spina Ventoſa*, differing perhaps only in degree; but I ſhall ſpend no Time in Defence of this Opinion, becauſe MERCKLINUS in my Judgment has ſufficiently demonſtrated not only this, but that the Diſeaſe itſelf was well known by the [h] Ancients, contrary to the [i] Opinion of ſome. Whoever deſires farther Satisfaction upon this Head, may turn Symptoms.

[a] See MERCKLINUS's Annotations on PANDOLPHINUS, and what we ſaid above at *Sect.* 3.
[b] See GORÆUS in Definit. Jo. A VIGO *in Chirurg.* and PETIT *Lib. de Morb. Oſſium, cap. de Exoſtoſi & Carie.* [c] MERCKLINUS relates a Caſe of this kind, where, upon opening a Tumor, nothing was diſcharged but a Flatus, and the Patient died. [d] See M. A. SEVERINUS's Book *de Pædarthrocace* contained in his excellent Work *De recondità abſceſſuum naturâ*; alſo the academical Theſes of AMMANNUS, TANSIUS, MÆBIUS, CHUNIUS, and others. [e] Caſes of this ſort may be ſeen in M. A. SEVERINUS *de Abſceſſ.* p. 144. and p. 467. RUYSCH, *Epiſtol. Anatomic. XIV.* BIDLOO *Exercitat. de Exoſtoſi.* [f] *Lib. de Spinæ Ventoſitate*, p. 53, 54, 248. et ſeq. [g] See *Goræi definitiones ſub hoc vocabulo* Τερηδὼν. [h] Pag. 52, 63, 257. et ſeq. [i] HEYNE was of this Opinion, *Lib. citat.* p. 62. He affirms that this Diſeaſe was not known till the Appearance of the *Lues Gallica*.

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to this Writer's Notes on PANDOLPHINUS's Book, which we have ſo often quoted. Laſtly, we muſt obſerve in this place, that PETIT in his Book *de Oſſium Morbis, Cap.* XVI. ranks all theſe Names and Diſeaſes under the Name of *Exoſtoſis*, and at the ſame time entirely neglects to mention the other Names, which are more vulgarly known, and in conſtant Uſe amongſt medical Writers. Whether he has judged well in this Caſe, I leave others to determine; for my own Part, I ſhall chiefly uſe the Term *Spina Ventoſa*, as the moſt received Name amongſt us at this time.

Differences. IV. But theſe Diſorders, particularly their *Differences* and *Degrees*, are, in my Opinion, not deſcribed with ſufficient Accuracy by moſt Writers. I intend to deſcribe them as clearly as I can, for great Numbers of theſe Caſes have fallen under my Care; and nothing can tend more to an Improvement in the Method of treating theſe Diſorders, than an accurate Knowledge of their Differences. A *Spina Ventoſa* is by us underſtood to be a Corruption and Eroſion, or *Caries* of the Bone, occaſioned by a Depravity of the contained Fluids, and ariſing generally ſpontaneouſly, without any external Cauſe, beginning, not upon the external Face of the Bone, but between its *Lamellæ* or *Cells*, or in its internal Cavity, and extending itſelf by degrees to the external Parts, at length affects either the [a] whole Bone, or a [b] greater or ſmaller Part of it, expanding it to a greater Width, or raiſing it into a Tumor (*See Plate* XII. *Fig.* 16. *A. B.*) which is frequently hard, and ſometimes without Pain; at other times it appears as if it was filled with Wind, and is attended with a greater or leſs degree of Pain, pricking, ſhooting, at laſt it grows red, and is attended with other bad Symptoms, till the diſordered Bone being by degrees corroded, the common Integuments and other ſoft Parts that lay over it, remaining at firſt entire, but at laſt partaking of the Diſorder, foul Ulcers of the moſt ſtubborn ſort break out. When Tumors of the Bone are hard, and the ſoft Parts not inflated, and are free from Redneſs, Inflammation, and Pain, as is frequently the Caſe in rickety Subjects, in this Caſe they are not attended with ſuch bad Symptoms as we have deſcribed above. SEVERINUS has given the Name of *Pædarthrocaces* to theſe Tumors, as we have already obſerved, becauſe this Caſe chiefly happens to Children, and in order alſo to diſtinguiſh it from the *Spina Ventoſa* of the *Arabians*. But the painful, red, inflated Tumors that happen equally to Children and Adults, are called *Spina Ventoſa*, [c] *Cancer vel Gangræna Oſſis, aut Teredines*. By an *Exoſtoſis* I mean a preternatural Eminence of the Bone, which is ſomewhat acute, or, if you pleaſe, an Excreſcence of the Bone, whether it is attended with Eroſion or not: A *Spina Ventoſa* differs from a *Caries*, by being accompanied with Tumor, and is to be diſtinguiſhed from the *Rickets*, becauſe rickety Subjects are attended with various deformed Tumors on the Epiphyſes of the Bones, without Pain or Eroſion.

The Part affected. V. Each of theſe Diſorders generally begin about the Heads or Epiphyſes of the larger Bones, where they are moſt tender and ſpongy, and where the noxious Matter may not only have ſufficient room to lodge in the cellular Subſtance, but where it will alſo meet with the leaſt Reſiſtance in ſoftening and expanding the Parts; nevertheleſs I have ſometimes ſeen this Diſorder ariſe in

[a] This happens to the ſmall Bones, ſuch as the Bones of the Fingers, *Carpus*, or *Tarſus*.
[b] This to the larger Bones, ſuch as the *Oſſa Cranii, Tibiæ, Femoris, aut Brachii*.
[c] HILDANUS gives you Inſtances of this kind, *Cent.* IV. *Obſ.* 95, 96.

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the Middle of theſe Bones, between their *Lamellæ*, eſpecially in the *Tibia*, *Tophs*, and *Venereal Gummata* as they are called, which ariſe in the *Os Frontis*, and on other Parts of the *Cranium*, and frequently on other Bones, particularly on the *Tibia*, may all be ranked under this Claſs, as they owe their Origin to an internal Cauſe, and are only diſtinguiſhed from the others by being particularly painful in the Night. Thus you ſee the *Spina Ventoſa* is not confined to the Bones of the Extremities, but ſeizes even upon the Bones of the Head, Face, Neck, and Breaſt, though the Bones of the Arms, Legs, Fingers, *Carpus* and *Metacarpus*, *Tarſus* and *Metatarſus*, are more frequently the Subjects of this Diſorder. You may ſee various Caſes of this kind in MERCKLINUS's Notes on PANDOLPHINUS, *pag.* 227. *et ſeq.*

VI. They ariſe, as we have declared above, generally ſpontaneouſly from internal Cauſes, from acrimonious, ſcorbutical, rickety, or variolous Humours; but principally from a Venereal Taint; for they were not ſo frequently [a] obſerved in *Europe* before the Appearance of the Venereal Diſeaſe. In the mean time it is reaſonable to ſuppoſe, nor is it contradicted by Obſervations, that this Diſorder may ſometimes owe its Riſe to [b] external Cauſes, eſpecially in Perſons conſtitutionally diſpoſed to theſe Diſorders; when, for Inſtance, the Veſſels between the *Lamellæ* of the Bone, or in the *Medulla* itſelf, are by a Blow, Fall, or any other external Violence injured or torn, and the Fluids extravaſated; by degrees they putrify, corrupt and deſtroy the *Medulla*, and ſoften and corrode the Subſtance of the Bone; whence proceed Pains, Tumors, Ulcers, and *Fiſtulæ* of Bones and the adjacent Parts, and all the ſame Miſchief which is uſual to ariſe from internal Cauſes. Generally from internal Cauſes.

VII. The Proximate Cauſe of this Diſorder is either a Collection or Congeſtion of a viſcid and thick, or of an acrimonious and corroding Humour; or an Inflammation ariſing in the *Medulla*, or in the Subſtance or Cells of the Bone, degenerating into an Abſceſs, and forming *Ichor* or *Pus*. As theſe ſtagnating Fluids can find no Diſcharge from the Bones, eſpecially from their Cavities, they are confined there, till they putrify and become acrimonious, corrode and deſtroy the neighbouring Parts, converting them, particularly the *Medulla*, into a like kind of *Sanies*, at length they attack the Bone, and deſtroy that. The Collection of viſcid and pituitary Fluids, with the Expanſion of the Bones, ſometimes happens without Pain, as in the [c] *Pædarthrocaces*; but the Eroſion of the Parts can never happen without the moſt acute Pains, proceeding, as we ſay, from the inmoſt Marrow: But in the Beginning of this Diſorder, when the Miſchief is only in the internal Part of the Bone, the Pain does not encreaſe upon external Preſſure; when the Pain encreaſes upon Preſſure, the external Parts are brought into conſent; when this happens, the *Perioſteum* and Parts that ſurround it, with the Subſtance of the Bones and the *Tunica cellularis* enlarge, from whence a Senſation frequently ariſes, as if the Parts were filled with Air or Wind, and the Diſorder was hence called *Ventoſa Spina*. But when Proximate Cauſes.

[a] Some are of opinion, that this Diſorder was abſolutely unknown till the Appearance of the Venereal Diſeaſe; as HEYNE *in Lib. de Morb. Off.* p. 62. but MERCKLINUS in his Notes on PANDOLPHINUS, *Cap.* 1. has plainly evinced the contrary, and ſhewn that it was known to HIPPOCRATES, GALEN, CELSUS, and others, who have deſcribed it under the Names of *Sideratio*, *Gangræna*, *Cancer Oſſis*, *&c.* which are only different Names for the ſame Thing. [b] See an Inſtance of this in HEYNE *de Morb. Off.* N°. 29. [c] MERCKLINUS thinks this cannot happen without Pain, but SEVERINUS and I have often ſeen it.

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the Tumor is opened, either ſpontaneouſly or by the Knife, if the Bone lays bare, you will frequently find it full of ſmall Eroſions, reſembling a Spunge or Pumice Stone, as it is in a *Caries*. From what has been here delivered, you may learn the near Reſemblance that theſe two Diſorders bear to each other, their Signs, and at the ſame time ſome material Differences by which they are to be diſtinguiſhed.

Degrees of a *Spina Ventoſa*.

VIII. A *Spina Ventoſa* ſtrictly ſo called, may very properly be divided into three Degrees; the firſt is, when the Patient complains of a continual grievous Pain in the Bone, which ſeems to him to proceed from the *Medulla*, and torments him ſo that he can have no Sleep. At this time there is no external Pain or Tumor: In this State the Diſeaſe is confined to the internal Part of the Bone. The ſecond Degree of the Diſeaſe is, when after theſe Pains a Tumor appears upon the Face of the Bone, either hard, or ſoft, and as it were windy, with external Pain more or leſs. The third Degree is, when, after all the former Symptoms, an Abſceſs is formed in the Tumor, which either burſts ſpontaneouſly, or is opened with the Knife, and diſcharges a fetid *Ichor*, or purulent Matter ſmelling like rank Butter or Lard, and afterwards maintains this Diſcharge in greater or ſmaller Quantities, like a *carious* Ulcer, and creates an Ulcer of this kind, which the Ancients frequently called an Ulcer with *Caries* of the Bone: This Species of the Diſorder may be called an *Inveterate Spina Ventoſa*, the other a *recent* or *incipient* one.

Pædarthrocaces.

IX. A *Pædarthrocaces* begins with an Enlargement of the Bone, and generally without any Pain or external Cauſe, but in its Progreſs it is frequently attended with Pain and Inflammation, and at length with Abſceſs, Ulcers, *Caries*, as in the *Spina Ventoſa*, eſpecially about the Joints and Extremities of the Bones, and in ſhort is attended with the ſame Symptoms with the *Caries* and *Spina Ventoſa*; from whence it is evident, that the *Pædarthrocaces* may in ſome meaſure be looked upon as a diſtinct Diſeaſe, in the Beginning, but if it is not preſently relieved, it will at length become a perfect *Spina Ventoſa*, differing from each other in nothing but Degree.

Prognoſis.

X. From conſidering what has been already delivered, eſpecially what has been taught in the preceding Chapter at *Sect.* 7. concerning the *Prognoſis* of a *Caries*, it will be no difficult Matter to form a *Prognoſis* of what we are to expect in the Courſe of Diſorders of this kind: For as it is manifeſt, that corrupted acrimonious Matter, when it is confined in the Cavity of a Bone, or included in its *Lamellæ* or Cells, cannot be eaſily diſcharged, either by Nature or Art; it neceſſarily follows, that it will by degrees corrupt and deſtroy the Parts that lay near it, till at length the Bone itſelf, if a timely Remedy is not applied, will be entirely corrupted and deſtroyed, ſo as to make it neceſſary to take off the whole Limb in order to ſave the Life of the Patient. Nay what is ſtill worſe, if this Diſorder ariſes from a vitiated State of the Blood, when you have taken off one Limb which ſhall have been affected in this manner, you ſhall have it return with equal Fury in another, in the ſame manner as it happens in cancerous Caſes; though this is not conſtantly the Caſe, eſpecially if you correct this State of the Blood by proper Remedies, and by enjoining a ſtrict Regularity with regard to Diet. In the *Pædarthrocaces*, and frequently in the two firſt Stages of the *Spina Ventoſa*, the Diſorder is happily cured by the Adminiſtration of proper Remedies; but the Cure will be attended with greater

or leſs Difficulty, in proportion to the Inveteracy of the Diſorder, the Progreſs it has already made, the Strength of the Patient, the Degree of Corruption in the Blood, the Number and Violence of other Symptoms that accompany it; nay, ſometimes it will be plainly incurable, and the Strength of the Patient being exhauſted, he dies tabid.

XI. There are two methods of treating a *Spina Ventoſa*; one ſuited to the two Degrees of the Diſorder, which we deſcribed above, as the milder State; the other to the moſt violent or third Degree, where the Bones, with the Parts ſurrounding them, are entirely corroded and deſtroyed. The beſt method that ever I could find for treating the ſlighter Degrees of this Diſorder, is the following. (1.) If the Patient is an Adult, endeavour to correct the Acrimony of his Blood, by preſcribing him a Decoction of the Woods, *ſc. ex Rad. Sarſaparillæ, Chinæ, Scorzoneræ, Ligno Saſſafras, Guaiaci, Juniperi.* Let him drink largely of this every Morning in bed, as warm as you uſually drink Tea or Coffee, giving him from eight Ounces to twelve Ounces at a time, according to his Strength. In the firſt Draught let him take *Eſſent. Lignorum, vel Pimpinell. ad Grs.* 50, *vel* 60. or ſome other Drops of the ſame Intention, endeavouring to raiſe a gentle Sweat. Theſe Medicines will penetrate into the fineſt Veſſels, and even into the bony Fibres, and drive out the noxious Humours, or correct them, greatly promoting the Digeſtion and Diſperſion of ſtagnating Fluids and Tumors. (2.) This Intention will be greatly forwarded by fumigating the affected Parts with the Steam from Decoctions of reſolving or aromatic Herbs. (3.) In the intermediate Times let the Part be rubbed twice in a Day with *Unguentum Mercuriale*, covering it afterwards with *Emplaſtrum Mercuriale.* (4.) At the ſame time it will be proper to preſcribe mercurial Remedies internally, to weak Perſons but once, to robuſt Habits oftener, ſo as to raiſe a gentle Salivation; this muſt be put in Practice, or omitted, according to the Degree of the Diſorder, and the Strength of the Patient. I am fully ſatisfied by Experience, that no Good is to be done in this Caſe without the Aſſiſtance of Mercurial Remedies, which makes it very ſuſpicious that this Diſorder proceeds from a venereal Taint, or has ſomething very near a-kin for its Cauſe. By diligently purſuing this Courſe for ſeveral Weeks (for it will not preſently gain ground) the firſt and even ſecond Stage of this Diſeaſe, where you have bony Tumors formed, may be cured, and the Tumors diſperſed, or at leaſt brought to that State, that they will not encreaſe, but remain as they are, without bringing on any Pain, or other remarkable Inconveniency. This I have frequently ſeen, where I could by no means diſperſe them; eſpecially where the Patient is regular and moderate in his Diet, living upon ſoft Broths inſtead of ſolid Meats, and drinking the ſmall Runnings of the aforementioned Decoction for his common Drink, or inſtead of that, the Decoction *Cornu Cervi, Hordei, Avenæ*, or any other thin aqueous Liquors.

Cure of the Spina Ventoſa.

XII. The ſame method muſt be uſed in treating the *Pædarthrocaces*, whether attended with Pain or not; giving frequently at proper Invervals, gently opening Medicines with ſmall Quantities of *Mercurius dulcis*. If this Diſorder is accompanied with the Rickets, you muſt adminiſter Medicines adapted to this Complaint, and adviſe frequent Exerciſe.

Cure of the Pædarthrocaces.

XIII. If either of theſe Diſorders ſhould be ſo far advanced, as to be out of the Reach of the Remedies we have already adviſed, the Pain and bony Tu-

Cure of a bad Spina Ventoſa.

mors encreaſe, Abſceſſes are forming, and you have great reaſon to fear the entire Deſtruction of the Bone; if the Abſceſs does not burſt of itſelf, you muſt not ſtay for its Maturation, but lay the Bone bare with your Knife in the moſt proper Place, which is generally the moſt painful, and deſcending Part, or where it is already burſt; if the Opening is too narrow, you muſt enlarge it; if your Patient dreads the Knife, make your Opening with a Cauſtic, and afterwards make ſeveral [a] ſmall *Foramina* in the Bone with the ſmall Piercer, *Plate* VII. *Fig.* 2. or *Fig.* 7. A. piercing down to the *Medulla*, that there may be room for a Diſcharge of the confined Matter. But where theſe *Foramina* are not ſufficient for the Diſcharge, you muſt make larger with the [b] Trepan, if the Bone will admit of it with ſafety; which will not only make greater Room for the Diſcharge of the corrupted Matter, but you will alſo be able to apply your Medicines more conveniently to the Part. Whilſt you are proceeding in this manner, you muſt inſiſt upon the internal Uſe of the Eſſence and Decoction of the Woods, with antimonial and mild mercurial Medicines; externally you muſt treat the Ulcer with cleanſing and balſamic Applications, ſuch as *Decoctum Agrimon. Saniculæ, Hyperici vel Ariſtolochiæ, cum Melle Roſar. & Eſſent. Myrrhæ ac Aloës*, which ſhould be injected with a Syringe twice every Day; or a Solution of *Mercurius dulcis in Aquâ Plantag. vel Aquâ Calcis*; afterwards you may dreſs with the Eſſences we have juſt mentioned, or *cum Eſſent. Maſtiches aut Succini*, ſpread upon Lint, covering all with a mercurial Plaſter, or with any other that you ſhall think more convenient: This method is to be continued till the Parts heal. Sometimes the actual Cautery may be uſed to advantage in this Caſe, to root out the Diſorder, eſpecially when it is only between the [c] *Lamellæ* of the Bone. Raſping or Scraping ſeems to me to be much better ſuited to the *Caries* of the Bone, than to the *Spina Ventoſa*.

Cure of the laſt Stage.

XIV. But when Things are ſtill worſe, and all the Remedies we have hitherto recommended are of no Effect; when the Part is already too much corroded and deſtroyed, ſo that there are no Hopes left of ſaving it, or indeed of ſaving the Patient, but by amputating the diſeaſed Part, you muſt determine on the Operation, which is to be conſidered in two Lights, according to the Difference of the Parts affected, 1. When the Diſorder is ſituated on the ſmall Bone, as on the *Carpus*, *Tarſus*, *Metacarpus*, or *Metatarſus*, or even on the Finger; it will not always be neceſſary to take off the whole Member, that is to ſay, the Finger, Foot, or Hand, but it will frequently ſuffice to remove the corrupted Bone alone. For Inſtance, when the laſt or middle Bone of one of the Fingers has been diſeaſed, I have taken out the foul Bone and left the ſound Part of the Finger remaining. When the *Metatarſal* Bone that ſupports the great Toe, has been diſeaſed [d], I have removed the corrupted Parts from the ſound, and ſaved the Toe. This I did in a Boy of ten Years of Age, and he re-

[a] This has been adviſed by CELSUS, PAREUS, SEVERINUS, SENNERTUS, MARCHETTUS. See MERCKLINI *Not. pag.* 483. *ſeq.* [b] CELSUS has recommended this method, *Lib. VIII. cap.* 283. and HEYNE *Lib. de Oſſ. Morb.* pag. 68. and PETIT *Lib. de Morb. Oſſ. cap. de Exoſtoſi:* and BOERHAAVE *in Aphoriſm. practic.* [c] SEVERINUS appears to be too fond of the actual Cautery in theſe Caſes, *cap.* 20. for frequently we cannot get to the Bottom with it, or the Parts are too much corrupted to expect Advantage from it. [d] LE DRAN, in Obſ. 112. recites nearly the ſame Caſe, where he took off *Metatarſus*, Toe and all; but this ſhould conſtantly be avoided where it is poſſible, for the Toe is of great Advantage in walking.

covered

covered ſo well, that he walked afterwards as well as before [a]. Where the whole Finger or only the firſt Bone has been foul, I have taken off whole Fingers and Thumbs.

When part only of a large Bone is foul.

XV. In larger Bones, when the whole Bone is not affected, but only a Portion of its external Surface is diſordered with a *Caries* or *Spina Ventoſa*, you muſt by no means take off the whole Limb, but remove that Part of the Bone only which is affected, in the ſame manner as we taught in the foregoing Chapter on the *Caries*, *Sect.* 16. But when a large Bone, as the *Os Humeri*, *Tibia*, or *Femur*, or entire Joint of the Arm, Knee, or Foot, is diſeaſed, there is no Remedy but Amputation, making your Wound in the ſound Parts above all that is diſeaſed: But we ſhall treat more fully of this Subject when we write on Chirurgical Operations.

When the whole Bone or Joint is diſeaſed.

Where the Tumor of the Bone will not give way.

XVI. In certain Species of the *Spina Ventoſa*, where the Tumor of the Bone will not yield to the Applications which we have adviſed above, and you can come at it with your Hands, Petit adviſes you to lay the Bone bare by a cruciform Inciſion, and to cut off the extreme Parts of the four Angles of the Skin; and, when this is done, to dreſs with dry Lint; on the Day following you are to bore ſeveral Holes in the Tumor, ſo near each other, that it may be pierced like a Sieve; you are then to take the whole off with a Chiſſel and Mallet; the Wound is then to be filled with dry Lint; and that the diſeaſed Parts may ſeparate the ſooner from the ſound, he orders the foul Part of the Bone to be dreſſed with a Solution of Mercury in *Aqua fortis*: This method is to be continued till you have obtained an Exfoliation. He is very high in the Commendation of this Proceſs, and I think deſervedly prefers it to any other Remedy in theſe Caſes, even to the actual Cautery, where the *Caries* has not penetrated too deep.

How to remove an *Exoſtoſis*.

XVII. When an acute Eminence or Excreſcence, which is properly called an *Exoſtoſis*, puſhes preternaturally above the Bone, creating no Diſturbance, Pain, or Deformity, and unaccompanied with *Caries* or *Spina Ventoſa*, as I have frequently ſeen them; in my Judgment it is beſt to let it alone, for the Remedy will be worſe than the Diſeaſe, and, by laying the Bone bare, you may bring on a *Caries* or other Inconveniences. On the other Hand if it occaſions any Deformity, impedes any Action, or produces Pain or other Miſchiefs, you may take it off in the manner we have juſt taught above. You may ſee various Caſes of *Caries*, *Spina Ventoſa*, and *Exoſtoſis*, in the Figures of that ſplendid Work, Cheselden's Osteography from Plate XLI. to the End: In Ruysch, *Obſ.* p. 94. in his *Theſaur. Anatom.* VIII. *Tab.* 3. and *Theſaur.* X. *Tab.* 2.

CHAP. X.

Of Ulcers *of the Head.*

What theſe Diſorders are.

I. It remains with me now to ſay ſomething of Ulcers of the Head, and particularly of thoſe which occupy its hairy Part, and are at this time called either *Tinea*, *Favus*, or *Achores*; but the Profeſſors of Medicine do not at all agree about the Signification of theſe Terms. By the Term *Favus*, we com-

[a] See in Sculter. *Obſ.* 90. the Caſe of a Thumb and Hand taken off for a *Spina Ventoſa*.

monly underſtand Ulcers of the Head, that are full of Cavities like a Honey Comb. By *Achores*, thoſe Ulcers which are full of ſmall *Foramina*, which contain a moderately viſcid Humour. Many call theſe Diſorders *Tinea*, becauſe from the Abundance of ſmall *Foramina* in them, they reſemble moth-eaten Garments; but for the moſt Part the Term *Tinea* at preſent is applied to a large dry Scab, which Children and Infants are ſubject to upon the Head, full of thick foul Scales, and very offenſive to the Smell; this ſometimes extends itſelf to the Face, in which caſe we call it *Cruſta Lactea*. This is often benign and of a mild Nature, but ſometimes ill-conditioned and dangerous. There is ſtill a worſe kind of *Tinea* or ſcabby Head, covering the whole hairy Scalp with an aſh-coloured thick Cruſt, attended with a violent Itching, and ſtinks grievouſly; this is generally very difficult of Cure: Perſons afflicted with this Complaint, have a very pale unhealthy Countenance. Theſe Diſorders are much more frequently met with in Infants and Children than in Adults. They are occaſioned either by the Nurſe's irregular Courſe of Life, or by the Child's being uſed to foul Feeding, from whence foul Blood is made, which produces Ulcers of this kind. Sometimes they break out in an adult State, reſembling a kind of Leproſy, which is very difficult to cure. In the *Pox* you frequently find both Head and Face, particularly the Forehead, ſpread with dry Scabs, and ſcabby Ulcers, which is called a *Venereal Scabies*. Venereal *Gummata* alſo and *Tophs* of the Head may be referred to this Claſs, ſince they frequently degenerate into Ulcers.

Cure. II. Though the Ulcers which we have juſt deſcribed, differ from each other in ſome Particulars, yet I ſhall not ſpeak ſeparately of them in this Place, as they are to be cured pretty nearly in the ſame manner. When they are ſlight, it will be proper to give a gentle Purge now and then, with the Addition of a ſmall Quantity of *Mercurius dulcis*, adminiſtring between whiles to an adult Patient, Decoctions of the Woods, with edulcorating Pills, Powders, or Eſſences. Infants at the Breaſt may take diaphoretic Powders, but their Nurſes may proſecute this Intention with Powders, Pills, Decoctions, or Eſſences. Externally, you may anoint the Scabs with *Cremor Lactis cum paucâ Ceruſſâ præparatâ miſtus*; or with *Oleum Ovorum* alone, or with the Addition of a ſmall Quantity of *Oleum Ceræ*, or with *Unguentum de Enulâ*, *de Ceruſſâ*, *Diapompholygos*, or with any other of the ſame Intention; obſerving at the ſame time regularity in Diet, and defending the Body from the Injuries of the external Air. By this method not only Ulcers of the milder kind are healed, but even thoſe of the more malignant ſort, eſpecially if you give ſmall Quantities of *Mercurius dulcis* at the ſame time, or mix *Mercurius Vivus* with your Ointments; but theſe Medicines are to be uſed with Caution.

Another Method. III. In worſe Degrees of this Diſorder, eſpecially where you cannot be perſuaded to uſe Mecurials, you will never ſucceed in your Cure, till you have taken off all the Hair, with which theſe Ulcers have a ſtrong Connection. In ſome Places it is the common Practice to pull out the Hair by the Roots, either by degrees, or at once, with a *Pitch Plaſter*, which is ſpread upon a ſtrong Cloth, or upon Leather, and applied all over the Head, after the Hair has been cut off as far as the Scabs; when it has taken faſt hold, they let it lie on for twelve or twenty four Hours, and then they tear it off at once, and it brings away with it both the ſcabby Cruſt and the Roots of the Hair; but this cannot

be done without great Pain and Effuſion of Blood. When the Plaſter is torn off, they wipe away the Blood with dry Lint, and anoint the Head with ſome *Oleum Laterinum*, with the Addition of a little *Oleum Ceræ* warmed, and cover it with the *Emplaſtrum de Spermate Ranarum paucâ Camphorâ imprægnatum*; dreſſing in this manner every Day, till the injured Parts are clean, and then they heal with *Oleum Ovorum vel Eſſentia Succini.* They preſcribe internal Medicines to correct the Blood, ſuch as you ſaw in *Sect.* 2. and adviſe Regularity in Diet. Antimony either alone, or mixt with a ſmall Quantity of *Flores Sulphuris*, is very ſerviceable in this Caſe. You ſhould diligently avoid beginning with the Uſe of Mercurial or Sulphureous Ointments, becauſe they are very apt to repel the noxious Humours, and endanger the Life of the Patient; which Effect they are not obſerved to have after you have adminiſtred Cleanſers of the Blood for ſome time internally.

IV. In ſcabby Ulcers of the Face which happen in the Infant State, and are vulgarly called *Cruſta Lactea* or *Achores*, the ſame evacuating and corrective Medicines, are to be preſcribed for the Nurſes, which we ordered above *Sect.* 2. the Infants themſelves alſo ſhould be purged frequently, and in the Intervals between purging ſhould take diaphoretic Powders prepared *ex Antimonio Diaphoretico, Lapid. Cancrorum, Antimonio crudo, & Flor. Sulphuris.* When they have taken theſe Medicines for ſome time, you may daub the ſcabby Parts with a Liniment made *ex Cremore Lactis cum Cretâ vel Ceruſſâ*; or in the room of this you may uſe *Oleum Ovorum cum pauco Olei Laterini.* Ointments prepared of Mercury or Sulphur are very dangerous in the Beginning of this Diſorder, or to very weakly Infants. But if Remedies of this kind ſhould be uſed by unſkilful Perſons, which is frequently the Caſe, to the Detriment of the Patient, you muſt endeavour to ſtrike the Humours out again by preſcribing Sudorifics in different Forms, both to the Infant and its Nurſe, till you have ſatisfied this Intention. Cure of the *Cruſta Lactea.*

End of the FIRST PART.

INSTITUTIONS OF SURGERY.

THE PREFACE.

HAVING finiſhed the Firſt Part of our Inſtitutions of Surgery, which treats profeſſedly of the Five kinds of Diſorders of the Human Body which require the Aſſiſtance of the Surgeon; to wit, Wounds, Fractures, Luxations, Tumors, *and* Ulcers; *we ſhall proceed now to the Second Part, which is dedicated to* Chirurgical Operations. *And in this Volume I ſhall take an Opportunity to treat of ſuch Diſorders as remain undeſcribed, either as not properly belonging to any of the foregoing Heads, or ſuch as require particular Contrivances and Machines to be made uſe of in their Cure. In doing this we ſhall conſult Order as far as the Nature of the Subject will admit of it. We ſhall firſt deſcribe thoſe Operations, which may be performed in almoſt all, or at leaſt in various Parts of the Body; as opening a Vein, making Iſſues, applying the actual Cautery, taking off Excreſcences or entire Parts of the Body; we ſhall then proceed to thoſe which have their proper Situations, and happen each to one particular Part of the Body. In performing this Part of our Work we ſhall begin with thoſe which belong to the Head and each of its Parts, as the Cranium, Eye-lids, Eyes, Ears, Noſe, Lips, Teeth, Gums, Tongue, Palate, Tonſils, Uvula, &c. Then we ſhall deſcribe thoſe Operations, which are accommodated to Diſorders of the Neck: From thence we ſhall proceed to the Breaſt, ſo on to the Abdomen, and its neighbouring Parts, to wit, the Anus and Pudenda of both Sexes; laſtly, we ſhall deſcribe thoſe Operations which are performed on the*

upper and lower Extremities. Notwithſtanding the great Number of theſe Operations, and the various Methods of performing them, will render this Taſk extremely difficult, yet it ſhall be our principal Care to explain the Nature of each particular Operation, the beſt Method of performing it, and the fitteſt Inſtruments to be made uſe of for that purpoſe, with all the Clearneſs that the Subject will admit of. By purſuing this Method, we ſhall not only teach the young Beginner the firſt and ſolid Principles of Surgery; but the Surgeon alſo who has already had ſome Experience in his Profeſſion, will, I hope, find ſomething in theſe Inſtitutions, by which he may in ſome meaſure at leaſt, perfect and adorn his Art.

THE

INSTITUTIONS OF SURGERY.

PART II.

Of OPERATIONS.

SECT. I.

Of General Operations practicable in ſeveral different Parts of the Body.

CHAP. I.

Of PHLEBOTOMY *in general.*

Phlebotomy what.

I. WE begin with the Operation of *Phlebotomy*, becauſe it is of all the moſt general, performed in moſt parts of the Body, and by much the moſt frequent in uſe at this preſent Day. By *Phlebotomy* or Bleeding we here intend the Apertion of a Vein, by a ſharp-edged and pointed Inſtrument of Steel, for extracting a proper Quantity of Blood, either for the Preſervation or Recovery of a Perſon's Health.

A moſt ancient and uſeful Operation.

II. *Veneſection* appears to be not only one of the moſt uſeful, but moſt ancient Operations in Surgery, ſince we find by the Writings of *Hippocrates*, *Celſus*, and others, that it was even celebrated near three thouſand Years ago. Yet there have not been wanting ſome among the Ancients who have deteſted and reviled this Practice, as both cruel and fatal to the Healths and Lives of Mankind, as *Eraſiſtratus*, *Paracelſus*, *Helmont*, *Portius*, *Bontekoe*, *Gebema*, &c. But I think all their Objections too weakly founded to need any Refutation, which might very well be made even only from the daily Experience we have of the great Uſefulneſs of this Operation, in alleviating, preventing and curing moſt Diſorders of the human Body, eſpecially thoſe of the acute and inflam-

matory kind. The Operation is ſaid to have been firſt hinted to us by the *Hippotamus*, who at ſtated Seaſons uſed to open a Vein with a ſharp-pointed Reed, according to *Polydore Virgil*, *de Rer. Inventor. pag. m.* 65.

Phlebotomy often difficult.

III. Nor is the Operation in many Caſes practicable with ſo much Eaſe and Safety as is commonly imagined; for though in ſome Patients the Veins lie ſo open and conſpicuous that even a Novice will find no Difficulty in making their Apertion, yet in others they are either ſo ſmall or deeply ſituated that the moſt expert Surgeon is ſometimes at a Loſs, and may by Accident miſcarry. Add to this, that as the Arteries, Nerves, and Tendons, are frequently very nearly ſeated to the Veins, 'tis no uneaſy Matter to injure one or other of them with the Inſtrument uſed in Bleeding; which is quickly followed either with a profuſe or fatal Hæmorrhage, an Aneuriſm, violent Pains, Inflammation, Fever, Mortification, or even Death. *Phlebotomy* therefore ſhould be performed with no leſs Judgment and Caution than the other important Operations in Surgery; eſpecially as the Reputation of a young Surgeon may ſuffer as much by Neglect or Accidents in this way as in many of the other leſs uſual and ſeemingly more difficult Operations.

Qualifications of the *Phlebotomiſt.*

IV. A good *Phlebotomiſt* ſhould have a ſteady, nimble, and active Hand, with a ſharp Eye and undaunted Mind, without which he may either be liable to miſs the Vein, or commit ſome Accident that may be injurious or fatal to the Patient and his own Character. For theſe Reaſons it is that Veneſection is leſs readily practiſed by the Surgeon as he advances in Years; becauſe old Age is generally accompanied with a weak Eye, and a trembling Hand.

Inſtrument for Bleeding.

V. The Inſtrument which is in common uſe amongſt the Surgeons for opening a Vein is called a *Lancet*. The Shape of this Inſtrument is deſcribed at *Plate* I. *A.* and at *Plate* XI. *Fig.* 5. The Surgeon ſhould take care to be always provided with a ſufficient Number of theſe, and to have them conſtantly in order, and to have ſome alſo of a larger Size; thus he will be prepared for Veins in different Subjects: And as this is an Operation that frequently requires to be performed on a ſudden, he will never be at a Loſs. There are many Surgeons in *Germany*, particularly in *Franconia*, *Bavaria*, and *Lower Saxony*, who bleed with a *Fleam*, *Plate* XI. *Fig.* 3. which they uſe in this manner: They hold one of their Fingers upon the Part *B*, and applying the Point *A* to the Vein, they ſtrike the Part *C* with one of the Fingers of the other Hand, opening the Vein as Farriers do in Horſes. Some of the Surgeons and Bagnio-men uſe a neater Inſtrument, an *Elaſtic* or *Spring Fleam*, which the *Germans* call *Schnâpper*, or *Schnâpperlein*, *Fig.* 4. when they have drawn it up, they apply the Point *A* to the Vein, and then let it go by preſſing upon *B*. Some again uſe a Lancet in the Form of a Dart, the Figure of which you may ſee in Crone *de Veneſectione*, *pag.* 33. *Fig.* 4. But ſince the Poſition and Size of the Veins are different in different Subjects, we find that the moſt convenient Inſtrument for our Purpoſe is the *French* Lancet; though many of our Surgeons are very expert in the Uſe of the *German* Lancet, *Fig.* 3. and 4.

In what Part the Operation is to take place.

VI. Though the Operation of Bleeding is frequently performed in different Parts of the Body, as in the Hand, Foot, Forehead, Temples, Neck, Tongue, *Penis*, and other parts, yet it is moſt generally performed in that Vein of the Arm which lies near the Joint of the *Cubit*: Therefore we ſhall begin with teaching

teaching the Method of opening this Vein, and treat more fully of it than of any other.

CHAP. II.

Of Opening the Veins of the Arm.

I. IT is commonly enough known, that the Operation of Bleeding in the Arm is performed on the Veins that lie on the internal Part of the *Cubit*. There are ſeveral Things worthy the Surgeon's Notice in this Operation: Some of which regard the Things that are to be done preparatory to Bleeding, ſome in the Operation itſelf, others immediately after the Performance of it; of each of which we ſhall ſpeak diſtinctly in their order. Preparatory to Bleeding you ſhall have in Readineſs, (1) *a Linen Fillet*, about a *Paris* Ell in Length, and two Fingers in Breadth, with or without ſmall Strings faſtened at each End of it. (2) Two *ſmall ſquare Bolſters*. (3) *Porringers* or Veſſels to receive the Blood. (4) *A Sponge* with warm Water. (5) Some *Vinegar*, *Wine*, or *Hungary Water*, to raiſe the Patient's Spirits if he ſhould be inclinable to faint. (6) *Two Aſſiſtants*, who muſt be void of Fear, one to hold the Porringer, the other to reach you any thing that you ſhall want. (7) *A ſmall Wax Candle*, when the Patient is to be blooded at Night, or in a dark Place. (8) You muſt place your Patient upon a *Couch*, or, if he is very fearful of the Operation, lay him upon a Bed, leſt he ſhould fall into a Swoon. (9) Laſtly, you ſhould take care that no Hair, or the Cloaths of the Patient lie in your Way; and the Patient himſelf ſhould take care that nothing ſhould give him any Concern; and he ſhould avoid terrifying himſelf with recollecting the Miſchiefs which have happened by the unſkilful Performance of this Operation. Laſtly, the Operator ſhould be as expert in bleeding with his left Hand as with his right; for as you are readier at bleeding in the right Arm with your right Hand, ſo when you are to open the Veins of the left Arm, you will find it neceſſary to uſe your left Hand; and there are ſome Patients who inſiſt upon being blooded in the left Arm. Preparation for Bleeding.

II. Though the Operation is to be performed at once, with one Puncture, yet many Things are to be obſerved in order to render it ſucceſsful. Firſt, it is neceſſary for the Surgeon to inſpect his Patient's Arm diligently, that he may ſee the Courſe of the Veins; he muſt then take hold of the Arm, and extend it towards his Breaſt, tucking up the Sleeve about a Hand's breadth above the Bend of the *Cubit*, where he muſt make his Ligature, rolling the Fillet twice round, and faſtening it with a Knot (*Plate* XI. *Fig.* 1. *D.*) The Veins being compreſſed, and the Blood being ſtopped in its Return, they will enlarge, and lie fairer to the Eye. The Ligature generally uſed upon theſe Occaſions is a Slip of fine Scarlet Cloth; but any other Colour will anſwer the Purpoſe as well. When you have bound up the Arm in this manner, you let it go for a ſmall time till you have taken a Lancet out of your Caſe, and opening it ſo that it may make a ſort of an obtuſe Angle, you take hold of it with your Teeth about the Joint (*A. Plate* XI. *Fig.* 5.) and hold it ſome time till the Veins grow turgid, you are then to lay hold of the Arm again in the ſame manner What is to be done in the Operation.

as we directed before, and extend it to your Breaſt, having an Aſſiſtant ready with the Veſſel in his Hand, at a convenient Diſtance, for receiving the Blood.

What Vein is uſually opened.

III. You are now to examine which Vein lies faireſt, and is therefore moſt proper to be opened; for you muſt obſerve that in the Arm there uſually appear three principal Veins: The firſt is called *Vena Cephalica*, and is found in the external Part of the Arm. *See Plate* XI. *Fig.* 1. *A.* The ſecond is termed *Baſilica*, and lies on the internal part of the Arm; in the right Arm it is alſo called *Hepatica*; in the left, *Splenetica*. *See ibid. Letter B.* The third, which is obliquely ſituated between the former two, is called *Mediana*. *See Letter C.* The median and baſilic Veins, as they are larger than the cephalic, diſcharge a greater quantity of Blood, but are attended with more Danger in the Operation; for a conſiderable Artery and the brachial Nerve lie under the baſilic Vein, and the Tendon of the Biceps Muſcle under the median: But as they lie fairer to the Eye, and are therefore more frequently the Subjects of the Operation we are treating of, than the cephalic Vein, it is ſafer and more eligible for the leſs experienced Surgeons to open the cephalic, or at leaſt the median Vein. But ſometimes the Veins are ſo ſituated in the Arm, that only one of them will lie expoſed to View; which deprives you of all Choice. Your only Safety in this Caſe depends upon your Choice of a ſkilful and cautious Surgeon.

In what Part the Vein is to be opened.

IV. When you have determined which Vein to open, you are to perform the Operation on that Part which preſents itſelf faireſt to you; but if the Vein has frequently been opened, and the Part which appears largeſt and faireſt is full of Cicatrices, you are not to open above, but below the Cicatrices, by which means the Blood will diſcharge itſelf more freely; for the Part above is generally ſtraitened by the Cicatrix. For this Reaſon, whenever you open a Vein for the firſt time, begin as high as you can; by which means you will have the more Room to deſcend in repeated Bleedings.

What is to be done immediately before Bleeding.

V. Before you apply the Lancet to the Skin, when the Veins are not riſen, it will be proper to rub the Arm below the Bandage, which will drive the Blood back towards the *Cubit*, and render the Veins more turgid; whilſt this is doing in the right Arm, the Surgeon ſhould take hold of the Patient's Arm in ſuch a manner that he may lay his Thumb upon the Vein which he intends to open, to prevent the Blood from flowing back, and to keep the Vein from rolling: You are now to fix your Eye upon that Part of the Vein which you intend to open, and taking the Lancet out of your Mouth with your right Hand, ſo placed that the Thumb and firſt Finger may be fixed about the middle of the Blade, the other Fingers ſhould reſt gently upon the Patient's Arm, to prevent your Hand from ſlipping.

How the Puncture is to be made.

VI. Your Lancet is now to be puſhed lightly and carefully forward by your Thumb and Fore-finger, till it has penetrated through the Coats of the Vein, and at that Inſtant to be raiſed a little upwards, in order to enlarge the Orifice of the Wound, which will give a freer Paſſage to the Blood. The moſt common and convenient Size of an Orifice is about twice the Breadth of the Back of an ordinary Knife. You are to keep even between the two Extremes of Raſhneſs and Timidity in making the Puncture; for as in one Caſe you will only divide the common Integuments, and ſo leave your Work undone; ſo in the other you will run the riſque of wounding the Artery, Nerve or Tendon.

The Vein may be opened in three Directions: Some open it in a ſtrait Line, *Plate* XI. *Fig.* 2. *Letter* A. others traverſly *B*; but moſt Surgeons make an oblique Wound *C D*. If the Vein is to be opened in the left Arm, the Surgeon muſt change Hands, and do all with his left Hand which we have directed above to be done with the right. If you are to bleed with the *German Fleam*, place the Point *A* upon the Vein, and taking hold of the Extremity *B* with your left Hand, drive the Point of the Fleam into the Vein by a Stroke with one of the Fingers of your right Hand. But if you will phlebotomiſe with the Spring-Fleam, *Fig.* 4. you cock it by elevating the Hook *c*, and placing the Point *A* upon the Vein, by letting looſe the Spring, it is by a gentle Preſſure plunged into the Veſſel.

Treatment after Aperſion.

VII. Your Apertion being thus made, and the Inſtrument drawn inſtantly back, the Blood will then ruſh forth from the Orifice either in a large or ſmall Stream; hereupon your Inſtrument muſt be depoſited in the Baſon or Diſh, and not thrown upon the Bed, leſt it ſhould be loſt, or elſe injure the Patient. In the mean time the Blood muſt be permitted to flow as long as it ſhall be judged uſeful or neceſſary; and if it ſhould ſtop too ſoon, as it often may, from too great a Stricture of the Bandage on the Arm, it muſt be ſlackened a little, by which means the compreſſed Artery being ſet at Liberty, the Blood will flow from the Orifice as at firſt. If you find the Orifice obſtructed by too great a Tenſion of the Skin, or an Intruſion of the *Membrana Adipoſa*, you ought in that Caſe to return the bit of Fat, by preſſing with the Finger or a warm Sponge, and to relax the Skin by bending the Arm a little; and, laſtly, if the Orifice be obſtructed by thick grumous or congealed Blood, that Impediment may be removed by wiping with a Sponge dipt in Water.

What muſt be done by the Patient and his Attendants.

VIII. But that the Patient's Arm may not become painful or languid, by holding it long extended, the Surgeon ſhould ſupport it by the *Cubitus* for a little while, and then give him a Stick, or other cylindric Body, to turn round in his Hand, that by the Contractions of the flexor and extenſor Muſcles of the Fingers the Courſe of the Blood may be accelerated towards the *Cubitus*, which will be ſtill further promoted, if the Patient urges a little voluntary Cough. In the mean time his Attendants ſhould ſtand ready with other empty Cups or Veſſels for receiving the Blood, to carry off ſuch as are full, and adminiſter the Dreſſings for the Deligation, with cordial Water, and other ſuch Neceſſaries.

The Quantity of Blood to be taken.

IX. The Quantity of Blood neceſſary to be taken from the Vein at one Bleeding, muſt be determined by the Phyſician, from conſidering the Patient's Diſorder, Strength, Habit, and other Circumſtances; but when the Surgeon attends his Patient without a Phyſician, he may then ſafely proportion this Evacuation himſelf at his own Diſcretion, by reflecting on the Nature of the Patient's Caſe, his Age, Strength, Courſe of Life, and Fulneſs of Habit, *&c.* for he may permit the Patient that ſhews no Paleneſs of Countenance, nor Diminution of Strength or Spirits to bleed longer than thoſe who quickly grow faint, *&c.*

Method of cloſing and binding up the Orifice.

X. When there ſeems to be a ſufficient Quantity of Blood diſcharged, the Ligature muſt then be immediately taken off from above the Elbow, and the Skin about the Orifice muſt next be gently ſtroaked or preſſed together by the two Fore-fingers of the left Hand, by which means the Lips of the divided

Vein

Vein are more eaſily compreſſed and cloſed: But while the Surgeon is doing this with his left Hand, he takes the ſmalleſt of the two Compreſſes brought to him by the Servant, and applies it upon the Inciſion with his right Hand; but ſo as to let what little Blood may remain, betwixt the Orifice and the Vein, be diſcharged, before he impoſes the Compreſs. Over the firſt or ſmall Compreſs he ſhould impoſe another that is a little larger, preſſing them both gently on the Orifice with his left Thumb, till the Bandage is laid acroſs. But before the Deligation is performed, according to the Directions we ſhall give for that Purpoſe in the laſt Part of our Surgery, on Bandages, it will be a piece of Neatneſs and Decency in the Operator, to wipe off what Blood may have adhered to the Arm with a wet Sponge or Napkin, and then to go on with his Bandage. There are indeed many Surgeons who apply but one Compreſs, which they firſt wet in Water, Vinegar, Wine, or its Spirit; though, in my Opinion, two Compreſſes make the Deligation more firm and ſecure; and as for the other, it is no matter whether they are applied wet or dry, but the dry will ſit eaſieſt on the Part.

Treatment after Deligation.

XI. Having applied your Bandage, and drawn down the Patient's Sleeve over his Arm, he ſhould be ordered not to uſe it too early or violently, before the Orifice is well cloſed, which might excite a freſh Hæmorrhage, an Inflammation, Suppuration, or other bad Accident: And if the Patient ſhould faint away ſoon after the Operation, it may be then convenient to wet his Noſtrils with *Hungary* Water or Vinegar, and to ſprinkle ſome of the laſt, or elſe cold Water, in his Face; and eſpecially in Summer-time, to let in the freſh and cool Air, by opening the Windows, *&c.* Alſo, if any Wine or Cordial Water be at hand, you may give the languiſhing Patient a ſmall Draught thereof; and then the Surgeon will have nothing more to do than waſh his Hands and Inſtrument, before he puts up the laſt in his Caſe.

Judgment paſſed on the Blood.

XII. In the next Place, it is often cuſtomary to aſk the Opinion of the Surgeon or Phyſician preſent, concerning the healthy or morbid State of the Blood, from its external Appearance; in which Caſe the Surgeon ſhould always make a good Preſage to his Patient and By-ſtanders, even though the Blood ſhould appear bad: For it is not eaſy to expreſs the good Effects that may follow from chearing up the Patient's Mind; which is much better than to leave a heavy Impreſſion on it by a ſevere *Prognoſtic*. Therefore, if the Blood appear florid, the Surgeon ſhould declare it as a Sign that the Patient either is, or will ſpeedily be in good Health: If the Blood appears vitiated, or of a bad Colour, he muſt then pronounce the Bleeding will be extremely ſerviceable to him. If the Patient ſhould, in the mean time, be in a Swoon, the Surgeon ſhould take Occaſion even from thence to ſignify the great and ſpeedy Effect the Diſcharge will have towards the Recovery of the Patient's Health; and when ſuch or the like encouraging Diſcourſe has been paſſed, the Blood ſhould be ſet by in a cool Place, till the Phyſician or Surgeon renews his Viſit.

Whether the Patient may ſafely drink or ſleep after Bleeding.

XIII. If the Patient ſhould be thirſty, after Bleeding, you ought not to deny him the Pleaſure of drinking, eſpecially thin Liquors; even the *French* make it a Cuſtom to give the Patient a large Draught of cold Water after *Phlebotomy* in inflammatory Diſorders; in which Caſes, if the Patient be of a warm Habit, that Practice may be extremely beneficial; but in cold and weak Habits, it ought not to be encouraged, for them it will be better to give ſome warm

warm Suppings of Tea, Coffee, or the like. If any Body ſhould propoſe the Queſtion, Whether the Patient may ſleep ſafely after his Bleeding? your Anſwer may be either in the Affirmative or Negative, according to particular Circumſtances. If the Evacuation was made by way of Prevention, or to preſerve the Body in its healthy State, it will be more adviſeable for the Patient to ſhake off his ſleepy Diſpoſition by walking, or engaging in ſome agreeable Sport or Exerciſe; becauſe if Sleep be indulged, the Bandage may get looſe, or ſlip up above the Orifice, and ſometimes thereby occaſion a profuſe and dangerous Hæmorrhage; which Objection ought not, however, to deprive the Patient of a comfortable Repoſe, in caſe of great Weakneſs and Indiſpoſition, eſpecially if he has had no Sleep for a long time before; then it would be denying him a Benefit perhaps greater than the Remedy of Bleeding itſelf. But for the greater Security, it may not be amiſs to let the Nurſe, or ſome body, have a watchful Eye over the Patient during his Repoſe, that in Caſe of ſuch an Accident, timely Relief may be had by compreſſing the Vein with one's Finger till the Surgeon can be called.

XIV. When the Surgeon or Phyſician comes again to viſit the Patient after his *Phlebotomiſation*, the Blood is uſually ſet out again to have a freſh Judgment paſſed upon it; in which Caſe the Verdict given ought to be ſuch as will exhilarate the Patient, and not depreſs his Spirits, agreeable to what we ſaid before on this Head at *Sect.* XII. The Surgeon muſt in the next place inſpect the Deligation, to ſee if the Bandage be too looſe; and in taking it off, if the Compreſs adheres to the Lips of the Orifice, he ought not to force it away, but to apply his Bandage again over it as before; and, after waiting a Day or two longer, it will ſpontaneouſly ſeparate, or fall off from the cloſed Orifice, which will by that time be near cicatrized. There are ſome, who being prejudiced in favour of the enthuſiaſtic Doctrine of Sympathy, will have their Blood run into cold Water, or have cold Water poured upon it, in febrile Complaints, thinking by that means to allay the Heat of the Blood; in this reſpect it may be of ſervice to humour and ſatisfy their Minds, though there may be nothing in the thing itſelf. Behaviour in your After-viſit.

CHAP. III.

Of Phlebotomy in the Hand.

I. THERE are two principal Veins in the Hands, which with us in *Germany* are ſometimes opened to bleed the Patient; the one is called *Salvatella*, and runs on the outer ſide of the back of the Hand towards the little Finger, being ſometimes denominated *Splenica* by the Ancients, who judged its Apertion extremely uſeful in Melancholy, and Diſorders of the Spleen: The other Vein, which is termed *Cephalica*, runs betwixt the Thumb and Fore-finger, and was formerly ſo denominated from an Imagination that bleeding from it was more particularly uſeful than from others in Diſorders of the Head. But we are at preſent convinced thoſe Notions of the Ancients were without Foundation, and that though the Patient is bled more difficultly and ſlowly by theſe Veins, yet the Effects will be the ſame as after *Phlebotomy* in the Arm. What Veins are opened in the Hand.

Yet

Yet it may be ſometimes convenient for the Surgeon to open them either at the particular Requeſt of the Patient, or when the Veins of the Arm are very deeply or obſcurely ſituated, and theſe lie fair and conſpicuous for Inciſion. To which we may add, that the Women in many Parts of *Germany* generally chooſe to bleed by this Vein, from an Imagination that it occaſions leſs Injury or Weakneſs to the *Fœtus*.

Method of phlebotomiſing in the Hand.

II. When you are therefore determined, from particular Reaſons, to phlebotomiſe in the Hand, the Patient muſt firſt hold it in warm Water for ſome time, rubbing it therein well with his other Hand, in order to make the ſmall Veins become turgid and conſpicuous; after which you are to fix a Ligature upon the *Carpus*, that the Veins may continue in that manner diſtended; and after the Hand has been wiped dry with a Napkin, you make an Apertion in the moſt convenient Part of the Vein, in the manner we directed for Veins in the Arm: And if the Blood does not flow copiouſly from the Orifice after Inciſion, the Hand ſhould be placed again in hot Water, and taken out when the Diſcharge is judged to have been ſufficient; this done, the Hand is next wiped dry with a Napkin, the Orifice defended with two Compreſſes, and your Bandage applied as we ſhall direct in *Part* III. *Chap.* VI. *Sect.* X. on Bandages.

CHAP. IV.

Of Bleeding in the Foot.

The Veins opened in the Foot.

I. BLEEDING in the Foot is an Operation of very old ſtanding; and it having been an Obſervation made by the moſt ancient Phyſicians, that *Phlebotomy* in this Part proved highly ſerviceable in moſt Diſorders of the Head and Breaſt, and for an Obſtruction of the menſtrual and hæmorrhoidal Flux, upon which Diſcharges greatly depended the healthy State of both Sexes: For theſe Reaſons they therefore denominated thoſe Veins of the Foot, *Saphena* and *Cephalica*, the laſt of which extends itſelf from the internal Ancle to the great Toe; and the firſt, from the external *Malleolus* to the ſmaller Toes: But why one of them ſhould be thought or denominated more cephalic than the other, there is not the leaſt Reaſon to be offered, ſince Bleeding from either of them has altogether the very ſame Effect; and therefore, in my Opinion, the Surgeon ſhould always open that which lies faireſt and moſt conſpicuous. But if the Veins upon the *Metatarſus* or Inſtep of the Foot do not well appear, it may be then convenient to open one of thoſe at the Ancle, or about the Calf or Ham of the Leg, as I have frequently done myſelf: Nor is the *Phlebotomiſt* ſo liable to injure any of the Tendons in theſe laſt Parts, as he is upon the *Metatarſus*. In the mean time the Operator ſhould in ſingle Women expect the Order of ſome prudent Phyſician for his Bleeding by theſe Veins; becauſe ſome of them, who are evil-minded, endeavour by this means to procure a Miſcarriage, which when known, might make the *Phlebotomiſt* a Sharer in the Reputation.

II. For

II. For the more eaſy and ſucceſsful Apertion of theſe Veins, the Patient muſt firſt waſh both Feet well for ſome time in hot Water, that when the Veins become ſufficiently turgid, the Surgeon may take his Choice of that which preſents faireſt either in the right or left Foot, without paying any deference to the Diſtinction of Right or Left, in any of the fore-mentioned Diſorders, ſince the Effect, as we obſerved, will be equally the ſame in either, if they are diſpoſed with equal Advantage for Apertion. Having fixed upon the particlar Foot and Vein, your Ligature muſt be applied about two Fingers breadth above the Ancle, and then the Patient muſt return it into the warm Water while the Surgeon takes out and prepares his Inſtrument or Lancet. Then kneeling down on one Knee, the Surgeon takes out the Patient's Foot from the warm Water, and having wiped it dry with a Napkin, places it upon his other Knee, or elſe upon a Board laid over the Veſſel of hot Water: He now faſtens or ſecures down the Vein from ſlipping with his left Hand, as in *Chap.* II. *Sect.* V. *& ſeq.* But if the Veins do not appear well under the Ancles, the Ligature muſt be removed higher, about two Fingers breadth above where you intend to make the Apertion of the Vein which beſt offers itſelf. 'Tis to be alſo obſerved, with regard to the Surgeon's Poſture, that he may ſeat himſelf on a low Stool or Chair, and place the Patient's Foot in the moſt advantageous manner upon either Knee; which Method will be preferable to the other in bleeding with the Spring-fleam, as many do in *Germany*; or the Patient may here ſet the Foot for the Operation upon a low Stool, or any other Support. Manner of opening theſe Veins.

III. The Blood from the Vein thus opened may be received into a Glaſs Cup or a Baſon, and if it does not flow freely from the Orifice, the Foot ſhould be returned into the warm Water, which will either prevent or diſſolve the congealing of the Blood that in this Caſe often obſtructs the Aperture. When a ſufficient Quantity of Blood has been thus drawn, which may be known partly from the Time, and partly from the largeneſs of the Stream, as alſo from the redneſs of the Water, and Condition or Strength of the Patient; the Orifice is then to be cloſed by the Finger, and after drying the Foot with a Napkin, to be ſecured by Compreſſes and Bandage. Concerning the Uſefulneſs of Veneſection in the Foot, conſult the Diſſertations of PERDUCIUS, HEREDIA and STAHLL, who have been oppoſed by HECQUET *in Lib. ſur la Saignée du Pied*, Pariſ. 1724. The firſt have been again ſeconded by *Jo. Bapt.* SILVA *Medic. Pariſ. in lib. de uſage des differentes ſortes de Saignées*, Amſtelod. 1729. Animadverſions againſt this laſt were alſo publiſhed at *Paris* in 1730, by M. CHEVALIER, Phyſician, and *Queſnay* Surgeon there. Treatment after Apertion.

CHAP. V.

Of bleeding in the Veins of the Forehead, Temples and Occiput.

I. THERE are many Phyſicians and Surgeons, who think that bleeding by the Veins of the Forehead and Temples is much more ſerviceable and expeditious in relieving all Diſorders of the Head, ſuch as violent Pains, Vertigo, Delirium, Melancholy, and raving Madneſs, *&c.* than the like Diſ- When and how theſe Veins are to be opened.

charge by Veins more remote from the Parts affected, judging that their Vicinity renders them more capable of evacuating the offending Matter of the Diſeaſe; but for my own Part I muſt frankly own, that to me there ſeems to be little or no Foundation to expect any conſiderable Difference in the Effects of Bleeding from theſe Veins, in order to a more expeditious Removal of ſuch Diſorders; and this becauſe the external Veins of the Forehead and Temples have little or no Communication with the Brain and internal Parts affected, and do generally yield but a ſmall Quantity of Blood. In my Judgment bleeding by the jugular Veins ſeems more likely to anſwer that Intention, as they receive the Contents not only of the fore-mentioned Veins, but alſo of thoſe immediately ſpent on the Brain and Parts affected, and are alſo more large and conſpicuous for Apertion. Yet if the Surgeon be expreſly ordered by the Phyſician to phlebotomiſe in the Forehead or Temples, in compliance therewith, he ought to obſerve, that before he proceeds to inciſe the Vein an Handkerchief or Neckcloth ought to be drawn tight round the Neck, that by compreſſing the jugular Vein, thoſe Branches of it may become more turgid and conſpicuous. The Vein being opened, the Patient muſt hold down his Head, that the Blood may not trickle from his Forehead into his Eyes or Mouth, when the Stream does not ſpin out with ſufficient Force; and if the Blood does not ſtop of itſelf after a due Quantity is diſcharged, you muſt compreſs the Orifice with your Finger, and, after wiping the Forehead and Face, apply a Compreſs or two, and then your Bandage.

Phlebotomy in the *Occiput.*

II. Bleeding from the occipital Veins, which communicate with the lateral *Sinus's* of the *dura Mater*, is both by Reaſon and Experience approved to be ſerviceable in moſt Diſorders of the Brain, where that Part is over-charged with Blood, which may be this Way diverted and evacuated. The celebrated Anatomiſt MORGAGNI [a] eſpecially recommends it, with Scarification and Cupping in thoſe Parts, for all lethargic Diſorders; and ZACUTUS LUSITANUS gives an Inſtance of a deſperate Apoplexy removed by deep Scarification and Cupping upon the *Occiput*, *De Medic. Princip. Hiſt. Lib.* I. *Hiſt.* 33. Theſe occipital Veins are opened by the ſame *Apparatus* as the Vein of the Forehead.

CHAP. VI.

Of bleeding in the Veins of the inner Corners of the Eyes.

When and how theſe Veins are to be opened.

IT is well known from Inſpection, and the Writers of Anatomiſts, that there are two Veins run one on each Side the Noſe through the *Canthi Majores*, or inner Corners of the Eyes, which proceed partly from the Forehead, and partly from the Eyes, and do, like the frontal Vein, diſcharge their Blood down into the external jugular Veins. 'Tis bleeding in theſe *canthal* Veins that has been univerſally approved by DIONIS, and the Generality of Oculiſts for Inflammations and other Diſorders of the Eyes; but upon no other Foundation, in my Opinion, than that of bleeding in the Forehead and Temples, (*Chap.* V.) However, when you are to phlebotomiſe in theſe Corners of the

[a] *Adverſar. Anat.* VI. *Animadver.* 83.

Eyes,

Eyes, you muſt firſt make a Stricture about the Neck, and after your Inciſion the Patient muſt incline his Head, that a ſufficient Quantity of Blood may be diſcharged from the Orifice without running into his Mouth, and then you apply a thick triangular Compreſs with Bandage. As for bleeding in the Veins of the Eyes, we ſhall conſider that in treating of the Diſorders incident to that Organ.

CHAP. VII.

Of Bleeding in the jugular Veins of the Neck.

I. IT has been a very ancient Practice to bleed in the external jugular Veins of the Neck, for moſt inflammatory Diſorders of the adjacent Parts, for a Quinſey, Phrenzy, Madneſs, Ophthalmia, Apoplexy, inveterate Head-achs, Lethargic, and other Diſorders of the Head. Nor are there wanting many among our modern Surgeons and Phyſicians to encourage the ſame Practice, and that even from the Authority of Reaſon and Experience; ſince the accumulated and obſtructed Blood and Humours may be this way diſcharged from the Parts affected, and their bad Conſequences prevented. Nor is the Operation at all dangerous, ſince the jugular Veins run on each ſide the Neck from the Head to the Clavicles, immediately under the Skin, and appearing generally very large, they may be eaſily perceived and opened; before which you muſt make a Stricture upon the lower part of the Neck with an Handkerchief, Neckcloth, or the common Ligature, which muſt be drawn tight by an Aſſiſtant or the Patient, to make the Vein turgid and conſpicuous; or you may place a looſe Bandage about the Neck, and let it be drawn downward ſtrongly over the Patient's Breaſt, either by himſelf or an Aſſiſtant; by which means the jugular Veins will be compreſſed on each Side, and become turgid without occluding the *Trachea*, or obſtructing Reſpiration [a]. When and which Veins of the Neck are opened.

II. When the jugular Veins have been by this means rendered turgid and conſpicuous, either of them which appears plaineſt may be ſecured by the Finger for Inciſion, either in the right or left ſide of the Neck indifferently, when the Diſorder lies in the whole Head, or in the Neck and *Fauces*; but when only one ſide of the Head, or one Eye is affected, I think the Vein ought to be opened on the diſordered ſide of the Neck. The requiſite Quantity of Blood being taken, the Ligature is next removed, and the Orifice compreſſed with your Finger, if the Blood does not ſtop without, while you wipe clean the Neck, and then apply your Compreſs and circular Bandage; thus the Blood ſtops without any Danger of a freſh Hæmorrhage, of which ſome are without reaſon afraid, as I have often experienced. Laſtly, it muſt be acknowledged that the Patient faints away as readily after bleeding in the Neck, as the jugular Veins are ſafely and eaſily opened; but then no Danger follows from thence. We have an excellent Treatiſe on the Uſefulneſs of bleeding from the Jugulars, publiſhed at *Breſlau* in 8°. 1735, by TRALLESIUS, a learned Phyſician of the ſame City. The manner of inciſing the Jugulars.

[a] While I am reviſing theſe Sheets for the Preſs, occurs a Woman to whom I preſcribe bleeding in the Jugulars for a violent Ophthalmia; but, upon applying the Ligature to her Neck, there is no Appearance of the Veins: An Accident I never before met with.

CHAP. VIII.

Of bleeding in the Veins, called Ranulæ, *under the Tongue.*

IT is very often found of no ſmall Service in a Quinſey, or other Inflammatory Diſorder of the Neck to bleed in the two ſmall Veins which run under the tip or end of the Tongue; eſpecially if a larger Vein has been opened before either in the Neck, Foot or Arm, whereby the inſpiſſated and ſtagnating Blood may be gradually evacuated. To bleed in theſe Veins, a Stricture being made upon the Neck as before, you then elevate the *Apex* of the Tongue with your left hand, while with the Lancet in your right, you circumſpectly open firſt one, and then the other on each ſide; becauſe the Apertion of one only will hardly ever diſcharge Blood enough to give any conſiderable Relief. When you judge a ſufficient Quantity of Blood has run out of the Mouth into your Veſſel, remove the Ligature from the Neck, upon which the Flux uſually ſtops of itſelf; but if it ſhould ſtill continue, let the Patient take a little Vinegar, or *Frontiniac* Wine in his Mouth, or elſe you may apply a bit of Vitriol or Alum, or a Compreſs dipt in ſome ſtyptic Liquor, till the Hæmorrhage ceaſes, which can never be dangerous even without ſuch Topics; for if there be not a good large quantity of Blood diſcharged in the inflammatory Diſorders of theſe Parts, the Apertion of theſe Veins will be of little or no Signification.

CHAP. IX.

Of Phlebotomy in the Penis.

BLEEDING in the *Vena dorſalis Penis* uſually ſurpaſſes the Benefit of all Remedies whatever in abating inflammatory Diſorders of this Member. This large Vein, which runs along the back or upper ſide of the *Penis*, being generally pretty much diſtended, and conſpicuous in an Inflammation of this Part, may be inciſed about the middle or back part of the *Penis*, and kept bleeding till the Member becomes flaccid, and a ſufficient quantity of Blood be diſcharged proportionable to the Urgency of the Symptoms; which done, you muſt apply a Compreſs, and the Bandage proper for the *Penis*, as we ſhall direct in the third and laſt Part of our Surgery. But you muſt carefully endeavour to avoid injuring the Arteries or Nerves which enter the *Penis* near this Vein; as alſo not to make your Bandage too ſtrict; for by theſe means the Inflammation and Symptoms may turn out worſe than before.

Of the Symptoms or Accidents which attend *Phlebotomy.*

CHAP. X.

Of an ECCHYMOSIS.

Ecchymoſis, what.

I. MANY are the Accidents which may follow from the Apertion of a Vein; but we ſhall here only conſider the principal, and begin with an *Ecchymoſis*, or Extravaſation of Blood from the Vein betwixt the Fleſh and the Skin; of which there may be various degrees; ſo that the Arm hereby often becomes not only much ſwelled, and of a black and blue Colour, but is even ſometimes violently inflamed with a moſt acute Pain, and followed either with a Suppuration, or incipient Mortification in the Limb.

Cauſes.

II. The Accident we are now treating of frequently proceeds from the Vein having been cut quite aſunder by the Phlebotomiſt; but oftener from the Patient's uſing his Arm too early after bleeding, in violent and long Exerciſes, in which the Contractions of the Muſcles make the Veins ſwell, and force their Blood through the Orifice into the Interſtices betwixt the Fleſh and Skin, either in a greater or leſs Quantity, in proportion to the degree of Violence and Exerciſe.

Conſequences of a ſlight *Ecchymoſis.*

III. In a ſlight *Ecchymoſis* or Effuſion of Blood under the Skin, there is little or no Danger to be feared, as the ſtagnant Blood may be generally diſperſed without any great Difficulty by the Application of a Compreſs dipt in Vinegar and Salt, or in Spirit of Wine. Sometimes the Blood ſuppurates or turns to Matter, which may be much promoted by a *Diachylon* Plaſter; and when the Matter is once brought to Maturity, it generally makes its own way through the Integuments, without the Aſſiſtance of any Inciſion; after which, being diſcharged, the Wound may be healed with a bit of *Diachylon* Plaſter.

Treatment of a large *Ecchymoſis.*

IV. If the quantity of Blood ſtagnating in an *Ecchymoſis* be very large and conſiderable, there is generally but little or no Hopes left to diſperſe it; but the Diſorder too often terminates either in a large Abſceſs or a Gangrene, after violent Pain and Inflammation have preceded. But to prevent theſe Conſequences, the Surgeon muſt take his Scalpel, and ſcarify, or make many little Inciſions upon the livid part to diſcharge the extravaſated Blood, and then apply either a *Diachylon* Plaſter, or the Fomentation before recommended for Contuſions and Phlegmons, (*Part* I. *Book* I. *Chap.* XV. *Sect.* X. & ſeq. *Book* IV. *Chap.* II. *Sect.* X.) But if the Arm is already poſſeſſed with a violent Inflammation or Gangrene, you ought to ſcarify it well, and then to inveſt it with diſcutient Cataplaſms or Fomentations, as we before directed in *Part* I. *Book* IV. *Chap.* XIV. *Sect.* VI. But at the ſame time in theſe Caſes it is often neceſſary to bleed in ſome other part, and to adminiſter attenuating Medicines internally, till the Inflammation abates, or the Gangrene ſpreads no farther.

CHAP.

CHAP. XI.

Of the Puncture of a Nerve or Tendon in Phlebotomy.

Signs of this Accident.

I. WHAT grievous and cruel Symptoms may ariſe from the pricking a Nerve or Tendon, we have before intimated, in treating of Wounds, *Part* I. *Book* I. *Chap.* I. *Sect.* X. *and* XI. But you may reaſonably judge, that a Nerve or Tendon has been injured in Bleeding, if the Patient, at the Time of Inciſion, feels a moſt acute Pain, ſo that he can ſcarce refrain from urging a ſevere Outcry; and, in a ſhort time after, the excruciating Pains ſtill continuing, the Limb ſwells, becomes inflamed, convulſed, ſtiff, and extended as in the Cramp; which Symptoms, if not timely relieved, threaten Convulſions of the whole Body, a Gangrene of the Part, and Death itſelf, in a ſhort time.

Treatment.

II. Among the ſeveral Methods of treating theſe Symptoms, from ſuch an Accident, that ſeems to be one of the beſt, which was formerly uſed for the *French* King, *Charles* IX. by his Surgeon *Amb. Parey*. For the king had no ſooner declared his intenſe Pain, by crying out aloud, while the Vein was opening, than *Parey* imagined, with good reaſon, that ſome Nerve was injured; and accordingly, the Arm began to ſwell in a little time with excruciating Pains, and at length became quite rigid. Hereupon the King's Phyſicians were immediately called into a Conſultation with *Parey*, and the Treatment agreed on was firſt to bathe the Part injured with warm *Ol. Terebinth. cum Sp. Vin. rect.* and then to inveſt the whole Arm in *Emplaſt. Diachalciteos in Ol. & Acet. Roſar. ſolut.* retained by the expulſive Bandage, which, beginning upon the Hand, aſcends gradually by ſpiral Turns to the top of the Shoulder; by which means the Impulſe of the Blood on the part was not only much abated, but alſo the Pain and Inflammation much diminiſhed. And laſtly, to compleat the Cure, the following Cataplaſm was ordered to be applied to the Arm.

℞ *Farin. Hord.*
Orob. ana ℥ ij.
Flor. Chamæmel.
Melilot. ana M ij.
Butyr. recent. ℥ jſs.

Theſe boiled into a Cataplaſm with Soap-ſuds, were applied to the Arm, till the Pain, and other malignant Symptoms, were totally removed; notwithſtanding which, the King had a Stiffneſs in moving his Arm for near three Months afterwards; but, by degrees, that went off, and his Arm grew as ſtrong and agile as ever.

A ſecond Method of Cure.

III. Equal Succeſs may be alſo expected from treating the Part with warm *Hungary* Water and *Balſ. Peruv.* for ſeveral Days, till the Pain goes off; and as the *Diachalciteos* Plaſter is ſeldom retained in many of the Apothecaries Shops, you may ſubſtitute *Emplaſt. de Minio vel Saturninum & Diapompholygos*; but Care muſt be taken, in the mean time, while theſe Remedies are preparing, not to expoſe the Wound open to the Air; and therefore the Wound may be at firſt covered with a bit of any ſort of Plaſter, and the whole Arm inveſted with a Linen Cloth moiſtened with Oxycrate, which will both abate the Inflam-

Inflammation, and exclude the Injuries of the Air or Duſt from the Part. If the Patient be young, and of a full Habit, it will be alſo proper, at the ſame time, to bleed plentifully in the other Arm. SCULTETUS, *Obſ.* 83. has an Ointment which he much extols for Punctures of the Nerves, as you may there find; where he alſo relates, that he has ſeveral times ſucceſsfully cut through, or totally divided ſuch punctured Nerves.

CHAP. XII.

Of Wounds of the Arteries in Phlebotomy.

I. IN bleeding it ſometimes happens, that an Artery is pitched upon and opened inſtead of, or together with, the intended Vein, and this more eſpecially when the Surgeon bleeds in the baſilic Vein of the Arm, near to which uſually runs the large brachial Artery [a], an Apertion whereof muſt be followed with a dangerous Hæmorrhage, an Aneuriſm, or even Death; as *Hildanus* [b], with myſelf and others, have often obſerved, either from the profuſe Hæmorrhage, or from a Sphacelation of the Limb from the Courſe of the Blood being interrupted. That an Artery is thus accidentally opened inſtead of a Vein, you may diſcover by the Blood's ſpinning very forcibly from the Oriſice, by Starts or Leaps, rather than in an even Stream, and extending itſelf into a greater Arch from the Orifice to the Receptacle; the Colour of the Blood is alſo here much more florid, or of a brighter red, than that from a Vein; to which add, that if you here preſs your Finger on the Veſſel below the Orifice, the Blood ſtarts out more violently than before, and quite ſtops, or elſe greatly diminiſheth upon preſſing above the Orifice; quite the Reverſe of which ſucceeds in the Apertion of a Vein. *Diagnoſis.*

II. In caſe of ſuch a dangerous Accident, the Surgeon muſt firſt endeavour to keep up his Preſence of Mind, which is very apt to be confuſed by Fear, that thereby the Patient, or his Attendants, may not ſuſpect his Error. In the next Place, he muſt carefully obſerve, whether the Blood flows freely from the Orifice, or whether it inſinuates, in a conſiderable Quantity, betwixt the Integuments: If the firſt, he muſt take a large Quantity of Blood, even till the Patient faints, perſuading him and his Attendants, that his Blood appears ſo hot and redundant, as to make ſo large an Evacuation abſolutely neceſſary, after the Example of M. *Dionis*, when he ſlipt into this Accident. When the Patient is in a *Deliquium*, as the Flux then ceaſes, you may commodiouſly dreſs and bind up the Wound, and by this Precaution hinder a freſh Hæmorrhage, or an Aneuriſm. While the Attendants are otherwiſe employed, the Surgeon muſt place a Farthing, or ſome other Piece of Money, in the Folds of the firſt Compreſs, which being fixed on the Orifice of the Arm wiped clean, he muſt, upon the firſt, place two, three, or more thick Compreſſes, each larger than the other; and then bending the *Cubitus*, he muſt, for the greater

What the Surgeon muſt do in ſuch a Caſe, when undiſcovered to others.

[a] But I have alſo ſometimes obſerved this Artery near the *Cephalic* Vein.
[b] *Obſ.* 44. *Cent.* III. & LANCISIUS, *Lib. de Cord. & Aneuriſm.*

greater Security, apply two Bandages, in the ſame manner as after bleeding in a Vein, only a little tighter. It may be next proper to lay a thick, long, and narrow Compreſs upon the Arm, over the Artery, from its Inciſion to the *Axilla*, and to ſecure it in that Poſition by a ſpiral Bandage; that the brachial Artery being thus compreſſed, the *Impetus* of the Blood on the Wound may be abated; ſignifying to the By-ſtanders, that the Patient's Blood is ſo ardent and rapid, that it cannot well be reſtrained from bleeding again, without this particular Deligation; and thus perhaps his Error may eſcape unſuſpected. Inſtead of the firſt Compreſs with a Piece of Money, you may apply with equal, or more Advantage, a Lump of brown Paper chewed in your Mouth, and then the Moiſture preſſed out of it, ſecures it on the Orifice by ſeveral Compreſſes, and the Bandage as before.

Treatment of the Patient afterwards.

III. The Deligation being compleated, if the Patient does not then recover from the Swoon of himſelf, the uſual means are to be uſed to recover him, by ſprinkling cold Water in his Face, opening the Windows, applying Volatiles, Vinegar, or *Hungary* Water to his Noſtrils, *&c.* by which means, being brought to himſelf, he muſt be ſtrictly charged to refrain from Exerciſe, to live on a ſpare and thin Diet, and not to uſe his Arm for ſome time, leſt a Relaxation of the Bandage might occaſion a freſh Hæmorrhage, or an Aneuriſm; to avoid which, it may be alſo requiſite to ſuſpend the injured Arm a little bent in a Sling about the Patient's Neck; and, to keep it the more ſteady, the Sling may be pinned to the Patient's Cloaths, and at Night laid in a convenient Poſture on a ſoft Pillow.

Frequent Viſits neceſſary.

IV. A few Hours being elapſed after the Deligation, the Surgeon ought to viſit his Patient, and again, at ſhort Intervals, as often as he conveniently can, in order to inſpect the Arm and Bandage, to ſee that the latter ſits tight, and to prevent the Inſult of a freſh Hæmorrhage, Pain, Tumor, Inflammation, Gangrene, or other bad Symptoms. If every thing appears right, except only a ſmall, uniform, and ſoft ſwelling of the Arm, the Bandage ought nevertheleſs to remain on the Arm, till the fourteenth Day; for ſuch a ſwelling does not preſage any thing amiſs, even though it infeſt the whole Arm. But if your Bandage is perceived to get looſe, it ought to be taken off cautiouſly, and re-applied more cloſely; but while the Bandage is taking off from the Arm, the Artery ought to be compreſſed by the *Tourniquet*, or at leaſt by the Thumb of an Aſſiſtant, graſping the Arm, the Surgeon, in the mean time, holding his Thumb or Finger preſſed on the Wound, till he re-applies either the ſame or freſh Compreſſes and Bandage. But in this you muſt be careful not to force off the laſt Compreſs or Lump of brown Paper from the Inciſion, if it does not fall off of itſelf, but rather let it remain; however, if it ſhould ſeparate, you may dreſs the Wound with a little *Balſ. Peruvian. vel Capaiv.* till it is well cloſed, and out of Danger, in being liable to a freſh Hæmorrhage. If you come to your Patient, and find his Arm bleeding, the Trunk of the brachial Artery muſt be immediately compreſſed, either by the *Tourniquet*, or with the Thumb and Fingers of an Aſſiſtant fixed about the middle of the Arm; and having provided more or thicker Compreſſes and a longer Bandage, you then take off the old Dreſſings, waſh clean the Wound with warm Wine, or its Spirit, and next proceed to renew your Deligation more carefully, as we before directed. If the Surgeon meets with the Appearance of a Gangrene from too great a

Stricture

Stricture of the Bandage, he must unbind and foment the Arm, or treat it with the Remedies proper for that Case, and, augmenting the Number of his Compresses, re-apply his Bandage more closely than before; but if the Gangrene proceeds from a Loss of the Circulation through the Limb, by reason the other arterial Trunk of the Arm is absent, which seldom happens, in that Case you must amputate without delay.

The Patient's Regimen.

V. If the Surgeon meets with none of the forementioned Symptoms, for some time after his Deligation, he must order the Patient to keep on the Bandage for a Week or a Fortnight longer, keeping his Arm, in the mean time, free from Exercise or Motion, lest the Blood should, by that means, force and extend the, as yet, tender *Cicatrix*, into an Aneurism. His Diet must also be all along spare and light, as at the beginning; strictly avoiding all Wines and fermented Liquors, and every thing that will put the Blood into a violent Commotion; in which last Case the Surgeon will find it necessary to bleed in another Part. Thus you may avoid all Danger of an Hæmorrhage or an Aneurism, and the Patient's Arm will become as well as ever, especially if the Wound be dressed with a little *Balsam. Peruv. vel Capiv. &c.*

What must be done if the Error is detected.

VI. Thus far have we described the method, in which the Surgeon must proceed, when the Error is not discovered by the Patient or his Attendants; but if either of them have, in reality, smelt out the true Case, it will be the best way for him to make a free Acknowledgment of his Mistake or Accident, excusing the same by assuring them, it is no more than what may happen to the most expert Surgeon living, in opening some Veins; and then promising the Patient, that if his Directions are observed, he shall be perfectly cured, without any Damage; and thus he may compleat his Cure, perhaps better than if his Patient knew nothing of the Matter; for knowing the Case to be so much more dangerous than that of an incised Vein, the Patient will be more submissive, and the Surgeon's Orders more punctually observed.

Treatment when the Blood insinuates betwixt the Flesh and Integuments.

VII. When the Aperture of the Artery, and that of the Integuments, do not exactly correspond with each other, but the Blood being forced out of the Artery, insinuates itself betwixt the Flesh and Skin; in that Case, which very often happens, the Patient must not be bled *ad Deliquium*, for even after that, there may be so much Blood extravasated and retained betwixt the Integuments and Muscles, as may cause a Mortification of the Arm by its Putrifaction, or at least may render the Operation for an Aneurism absolutely necessary to be performed. If therefore the Surgeon cannot draw back the Orifice or Incision of the Integuments, so as to make it correspond with that of the Artery, and discharge the retained extravasated Blood, he ought immediately to compress the Wound with a Lump of chew'd Paper, and several Compresses, each larger than the other, which are all to be firmly secured on the Part by the Bandage or Deligation before described at *Sect.* II. of this Chapter, not forgetting the long Compress and Bandage, which we recommended for compressing the brachial Artery; and, after Bleeding plentifully several times in some other Part, the Remainder of the Treatment may be according to *Sect.* III, IV, V, and VI. preceding. But the Patient must be visited again in a little time, to inspect the Arm; for it often happens, that when you have no apparent Bleeding after Deligation, yet the Blood will insinuate itself betwixt the Muscles and

Integuments, ſo as to diſtend the Arm to an enormous Size, as DIONIS [a] obſerves; ſo that he was once obliged, in this Caſe, to inciſe the Integuments of the whole Arm, whereby he diſcharged four Pounds of Blood, that had been equally diſperſed all round, from the Elbow to the Shoulder: And we alſo meet with a ſimilar Obſervation in *Ruyſch* [b], in which concreted Blood was lodged almoſt all over the Arm. You may alſo conſult BARTHOLIN, *Epiſt. Med.* 53. *Cent.* III. *Hiſtor. Anatom.* IX. *Cent.* II. and his Hiſtory of an Aneuriſm diſſected, which he ſaw at *Naples*, *An.* 1644.

CHAP. XIII.

Of ANEURISMS.

What an Aneuriſm is.

I. A Throbbing Tumor, diſtended with Blood, and formed by a Dilatation, Wound or Rupture of an Artery, is by Surgeons uſually denominated an *Aneuriſm*; of which they diſtinguiſh two kinds, the *true*, and the *ſpurious*. A true Aneuriſm has always a Pulſation, more or leſs, and is formed by a Dilatation only of the Artery, either all around [c], or on one ſide of it, much in the ſame manner as thoſe analogous Tumors of the Veins are formed, which we term *Varices*. So that both Aneuriſms and Varices are a kind of *Herniæ* of the Arteries and Veins, and accordingly they are by ſome named *Herniæ Arteriarum & Venarum*. But the ſpurious Aneuriſm is when the Artery being opened by a Puncture, Wound, Contuſion, Eroſion, or other external Violence, extravaſates the Blood betwixt the Muſcles and Integuments, the Limb itſelf appearing livid, and much ſwelled thereby. A true Aneuriſm may alſo degenerate into one that is ſpurious, by a gradual Dilatation of the Artery, and Extenuation of its Coats, till at length being totally ruptured, the Blood is either extravaſated and retained under the Integuments, or diſcharged freely from the Wound. Hence the Tumor is much larger and leſs prominent, or pointed in the ſpurious, than in the true Aneuriſm, and is alſo attended with little or no ſenſible Pulſation; but the Putrifaction of the extravaſated Blood very often occaſions a Gangrene and Mortification of the Part, or even Death itſelf, by a profuſe Hæmorrhage. But Aneuriſms may be again diſtinguiſhed from their Circumſtances and Symptoms, into *ſimple* and *complicated*; the firſt being formed without any ill Accidents, and the laſt uſually attended with Immobility, violent Pain, an Abſceſs or Spacelation of

[a] Chirurg. Operat. Demonſtrat. VIII. Chap. of Aneuriſms. [b] Obſ. Anat. Chirurg. Obſ. 2. pag. 7.

[c] 'Tis a little extraordinary that the learned Dr. FREIND ſhould in his Hiſtory of Phyſic contend that all Aneuriſms are formed by a Rupture of the Artery; when we have ſo many Inſtances of their ariſing from a Dilatation only of the arterial Coats, either on one or all ſides. See that deſcribed by me in *Annal. Acad. Julia Semeſtri* XII. *p.* 81. Thoſe in PARRY's Surgery, and RUYSCHII *Obſ. Chirurg. & Hiſt. Acad. Reg. An.* 1712 & 1721. Alſo LANCISII *Lib. de Corde & Aneuriſmat.* & *Lib. de Motib. ſubitan. in Schol. Obſ.* 5. §. 2.

the

the Part, *&c.* which more uſually accompany the ſpurious Aneuriſm [d]. Aneuriſms may be alſo diſtinguiſhed, from the Situation of the Arteries, into *external* and *internal* [e], the firſt being acceſſible, the others not; and another remarkable Difference of them may be taken from their having either a violent or elſe but little or no ſenſible Pulſation [f]. For it is to be obſerved, as we before mentioned, that ſpurious Aneuriſms ſeldom have any conſiderable Pulſation, eſpecially when they are large; whereas the true Aneuriſms, eſpecially the ſmall, have a very ſtrong and ſenſible Pulſation; but in ſome of them the Pulſation encreaſes, and in others it diminiſhes, as the Tumor enlarges. See my Account in *Annal. Acad. Juliæ Semeſtri* XII. *pag.* 81.

II. In a true and external Aneuriſm, beſides the forementioned Signs, we obſerve a ſmall Tumor at the beginning, no larger than a Filbert, which has always a Pulſation. But as for the internal Species, as they lie concealed from our Senſes, little or nothing can be ſaid of their Signs, with which, however, the Reader may be ſupplied in LANCISI's Treatiſe on the Subject. The Tumor generally feels ſoft to the Fingers, with a ſort of Fluctuation and Reſiſtance of a Fluid, and is almoſt conſtantly of the ſame Colour with the Skin, having a Pulſation like that of the Artery to which it belongs. Upon preſſing the Finger on the Tumor, as yet ſmall, it diſappears; and upon removing the Finger it returns inſtantly again. But for the ſpurious Aneuriſm, that appears livid, feels hard and turgid, with intenſe Pains; but the Tumor is here more plain or equal, and generally without Pulſation, as upon preſſing it affords a ſort of rumbling or fluctuating Noiſe, and diſtending the whole Limb, or a great part thereof, to an unuſual Size [g], it very often degenerates either into an Abſceſs or a *Sphacelus*. *Diagnoſis.*

III. Aneuriſms moſt frequently ariſe in the brachial Artery, from an erroneous Puncture or Injury thereof, in bleeding in the Arm, eſpecially in the Baſilic Vein. For the Artery being in a conſtant Pulſation, will, by urging its Blood againſt the arterial Coats, gradually diſtend them where they make too little Reſiſtance, ſo as at length to form a conſiderable Tumor. If therefore a throbbing or beating Tumor like that deſcribed in the foregoing Paragraph ſhould appear in the Arm a few Days or Weeks after bleeding, it may be certainly depended upon to be an Aneuriſm. But the Origin of Aneuriſms is not from the Lancet alone, nor is their Seat reſtrained to the Arm only [h]; *The Seats and Cauſes of Aneuriſms.*

[d] A remarkable Aneuriſm of the ſpurious kind is deſcribed by BARTHOLIN in a profeſſed Diſſertation, entituled, *Aneuriſmatis diſſecti Hiſtoria*, Panormi 8vo. 1644. See alſo VAN HORNE *in Epiſt. de Aneuriſmate*; and LANCISIUS, *Lib. de Cord. & Aneuriſm.*

[e] Hiſtories of internal Aneuriſms may be ſeen in PAREY, Book VII. Chap. 32. Monſ. BLEGNI, *Zodiac. Med. Gallic. An.* 1681, *p.* 44. RUYSCH, *Obſ. Chirurg.* 37. LANCISI. *Et Annal. Acad. Juliæ loc. citat.*

[f] Of which I have made many Obſervations beſides thoſe in PAREY, *loc. cit.* RUYSCH, *Obſ.* 38. BLEGNI, *l. c. p.* 25, & 42. NUCK *Operat. Chirurg. Exper.* XXIX. LANCISI *l. c.*

[g] The ſpurious Aneuriſm often acquires an enormous Size, but the true one hardly ever exceeds the Bulk of a Cheſnut, according to GOUEY, *Chirurg. pag.* 23. But that his Opinion is not to be abſolutely depended on, may appear from the ſeveral Accounts we have of larger Aneuriſms, particularly one the Size of a Gooſe Egg in HILDANUS, *Obſ.* 44. *Cent.* III. PURMANNUS *Chirurg. curioſa*, *p.* 212. And in our *Tab.* XI. *Fig.* 6.

[h] AMB. PAREY, *Lib.* IV. *Cap.* 32. aſſerts the Neck to be the Part in which Aneuriſms are moſt frequently formed; but his Opinion is not countenanced by our later Experience and Obſervations.

For they may ariſe from an infinite Number of Cauſes, both external and internal, and may be formed in all parts where there are any arterial Trunks, or conſiderable Branches diſtributed. Thus we often meet with them from a Wound, Contuſion [1] and Suppuration, and from external Injuries in moſt parts of the Body. But internally they may ariſe either in the Thorax or Abdomen, from a Diminution of the Strength and Reſiſtance of the external or internal Coats of the large arterial Trunks, from various Cauſes, as an Ulceration, Eroſion, *&c.* agreeable to the Obſervations of FALLOPIUS, (*Lib. de Tumor. Cap.* 14.) SEVERINUS (*Lib. de Abſceſſibus*) RUYSCH *Obſ.* 37 & 38. LANCISI (*Lib de Cord. & Aneuriſmat.*) and our Obſervations in *Annal. Acad. Juliæ Semeſtri* XII. *p.* 81. We muſt however confeſs, that the Cauſes of internal Aneuriſms are often very doubtful and unſettled; notwithſtanding which, we ought to diſtinguiſh thoſe Cauſes as they occur, into external and internal; under the firſt of which comes the Violence offered from a Blow, Fall, or a Fracture of the adjacent Bone, or a violent Straining in lifting great Weights, jumping, riding on horſeback, *&c.* whereby the Blood is accumulated and urged ſo forcibly in the Artery injured, as gradually to diſtend its Coats, and form a Tumor. In the ſame manner too we often meet with Aneuriſms from a ſlight Puncture, or even barely touching the Coats of an Artery with a Lancet in opening a Vein; in which Caſe the exterior Coat of the Artery being divided, and the interior remaining entire, the latter is not alone ſtrong enough to reſiſt the Impulſe of the Blood, but gives way inſenſibly at each *Ictus* of the Artery, till it at length forms that conſiderable Tumor which we call an Aneuriſm. If we therefore conſider that the mechanical Formation of Aneuriſms is in this manner from a diminiſhed Reſiſtance in the arterial Coats, we ſhall find the Cauſes thereof very numerous, which may weaken an Artery more in one part than another, ſo as to make it give way to the Force of the Heart, or Impulſe of the Blood, and form an Aneuriſm, eſpecially when ſeveral Cauſes concur together, as if violent ſtraining or leaping, *&c.* be uſed when the Coats of the Artery are previouſly extenuated or weakened by a Contuſion, Inflammation, Suppuration, *&c.*

Diagnoſis of injured Arteries.

IV. I think we have in the preceding Chapter ſufficiently explained the manner of enquiring into the greater Injuries and Wounds of the Arteries, that may happen in opening a Vein; ſo that we ſhall here only enumerate the Signs by which to diſcover ſlight Punctures, or the ſmaller Injuries of them, which occur in *Phlebotomy*. But as we are not ſupplied with any certain or characteriſtic Signs indicating ſuch ſlight Accidents, we muſt make the beſt uſe of a reaſonable Conjecture. If therefore you ſhould perceive a Pulſation againſt the Point of your Lancet, notwithſtanding you have no Hæmorrhage from the Artery, yet you may reaſonably conclude that the external Coat of that Veſſel muſt be in ſome degree injured thereby; and therefore it will be proper to make your Deligation and Compreſſion to prevent an Aneuriſm, in the manner we before directed in the preceding Chapter.

[1] Thus FEHRIUS has obſerved an Aneuriſm in a Lad, from a Blow on the left Side of his Head, which in the Space of eight Days enlarged ſo as to cover half his Head. *V.* BARTHOLIN, *Epiſt.* 53. *Cent.* III.

V. But

V. But if a ſmall beating Tumor ſhould be formed within the Space of a Month after *Phlebotomy* either through the Neglect of the Surgeon or Patient, or from leaving off the Deligation too early, it may be pretty ſafely depended on to be one of theſe Aneuriſms from a ſlight Cauſe. But if it be a true Aneuriſm, whilſt it continues recent and ſmall, it gives little or no Uneaſineſs, beſides its Tumor and Pulſation; yet when it has afterwards gradually acquired the Size of an Egg, or one's Fiſt, or even the bulk of one's Head, as may be ſeen in PURMANNUS, *Chirurg. curioſ. pag.* 612. and in our *Tab.* XI. *Fig.* 6. it then occaſions intenſe Pains, Weakneſs, Immobility, and other bad Symptoms in the affected Limb, inſomuch that if the Help of the Surgeon be not ſpeedily called in, the arterial Coats becoming gradually extenuated will at length burſt, and be followed by a Train of the worſt Conſequences, if not the Death of the Patient. If the external Integuments ſhould be broke through, a fatal Hæmorrhage muſt follow, and even if they ſhould continue entire, an Abſceſs or Gangrene would deſtroy the Part, as I myſelf have obſerved here in a Patient at *Helmſtadt*, and ſee RUYSCH *Obſ.* 2. Though the Generality of Aneuriſms afford a dangerous *Prognoſis*, yet none are ſo much to be feared as thoſe which are formed internally in the larger arterial Trunks, where there cannot be had a free Acceſs to the Parts, as in the *Aorta*, *Subclavian*, beginning of the axillary, brachial, and carotid Arteries, *&c.* Thoſe Aneuriſms too are generally incurable which are formed in the carotid Arteries of the Neck, in the *Subclavian* or Axillary near the Shoulder, and in the crural Artery, eſpecially if near the Abdomen. For if the Operation be performed on any of theſe, it muſt be followed either with a profuſe or fatal Hæmorrhage, or elſe a Mortification of the Parts. But thoſe Aneuriſms are much leſs dangerous, and frequently admit of a Cure which are formed in the external Branches of the Arteries, eſpecially in thoſe running on the *Cranium*, or without the Ribs, and thoſe in the Foot, Hand, or lower Arm. Yet if the Aneuriſm be not recent, though even in the Arm, the Succeſs of the Operation by the Knife will be at leaſt very uncertain, when Deligation and Compreſſion alone will not take their due Effect: For as the arterial Trunk muſt neceſſarily be cloſed or ſhut, it will be almoſt next to impoſſible to prevent the parts, to which the Artery was diſtributed, from waſting away, or elſe from mortifying, ſince the Circulation of the Blood, and their Supplies of Nouriſhment are by this means in a great meaſure, if not totally, cut off; the lateral ſmall Branches of Arteries being incapable of importing a due quantity of Blood to the Hand and parts of the *Cubitus*, when one of the larger branches is wanting [k], which is therefore a frequent Cauſe of a Mortification in them, ſo as often to oblige the Surgeon to an Amputation, as hath been frequently experienced by myſelf and others [l]; and even Amputation itſelf will very often not ſave the Patient, as may appear from the Caſe in BARTHOLIN, *Epiſt.* 53. *Cent.* III. When an Aneuriſm burſts ſpontaneouſly, the Hæmorrhage is generally

Prognoſis.

[k] That the fellow arterial Branch of the *Cubitus* is not ſo often abſent as Surgeons have imagined, is made apparent, with other juſt Anatomical and Chirurgical Obſervations, in a Medical Diſſertation or Theſis had under me at *Helmſtadt*, by D. MORBIUS, *Ann.* 1730. the Subſtance of which I think to communicate in my Obſervations, which I intend to publiſh ſome time hence by themſelves.

[l] V. RUYSCH, *Obſ.* 2. BARTHOLIN, *Epiſt.* & VAN HORNE *de Aneuriſmate.*

ſo profuſe that the Patient's Life may be loſt [m] in a Minute's Time, if a ſpeedy Compreſſion be not made on the Artery by a ſtrict Ligature, or the *Tourniquet*, and the Aſſiſtance of an expert Surgeon: And extremely dangerous is the Caſe when the Surgeon by Neglect or Miſtake inciſes one of theſe large Tumors inſtead of an Abſceſs, as hath been ſometimes done [n]; yet it ought to be obſerved here that ſpurious Aneuriſms are in the general much more dangerous than the true ones. Even true Aneuriſms are ſometimes tolerable without any great Danger or Uneaſineſs for many Years [o], or as long as the Patient lives, eſpecially if they are defended and ſecured with proper Bandage and Compreſſes; whereas on the contrary, ſpurious Aneuriſms will not continue many Days without inducing an Hæmorrhage, Abſceſs and Mortification in the Parts. But both the true and ſpurious Species of Aneuriſms are always the more dangerous and troubleſome as they are larger; inſomuch that their Size has deterred the expert and intrepid HILDANUS [p] from performing the Operation on them. And RUYSCH openly declares [q], that in the vaſt City of *Amſterdam* no Surgeon had undertaken to perform the Operation for above twenty Years before him. The ſpurious Aneuriſm is alſo more difficult to cure even by the Knife than the true Species; becauſe the Blood which is extravaſated and concreted all around gives the Surgeon immenſe Trouble to diſcharge it. As for internal Aneuriſms, they not only lie concealed from our Senſes, but are alſo abſolutely deſtitute of any Help or Remedy from Art, becauſe they are inacceſſible to the Hand; but were an internal Aneuriſm to extend and ſhew itſelf externally, it could not be well ſubjected to the Operation, without greatly hazarding the Patient's Life; and therefore the Cure of ſuch have been prudently refuſed by the moſt eminent Surgeons, as FALLOPIUS, PAREY, SEVERINUS, *&c.* cited in BARTHOLIN's *Hiſtoria Aneuriſmatis diſſecti*; and for the ſame reaſon we here reſtrain our Doctrine and Treatment of this Diſorder to the external Species of Aneuriſms only. But they who deſire a more particular Account of the Internal, may conſult the learned Treatiſe on the Subject by LANCISI.

Treatment of ſlight Aneuriſms.

VI. I ſhall now, for the Information of the younger Surgeon, deſcribe the method of treating an incipient Aneuriſm, forming itſelf in the Flexure of the *Cubitus* or bending of the Arm, where this Diſorder more frequently occurs than in any other Part; and from hence, I think, he may eaſily judge of the method in which other leſs frequent Aneuriſms are to be treated. Whenever a ſmall Aneuriſm of the true Species begins to form, and ſhew itſelf at the Flexure of the Arm, you are furniſhed with two methods of relieving it, either by Deligation, or by Inciſion: The firſt of which may be again performed either by Compreſs and Bandage, or by an Inſtrument adapted for the Purpoſe. The method of relieving and curing this Diſorder by Deligation and Compreſſion, if there be no Extravaſation, ought always to be tried before

[m] V. Phil. Tranſact. N°. 402. Act. Erud. Lipſ. Tom. III. pag. 401. PAREY Lib. VI. Cap. 32.

[n] V. PAREY Lib. VI. Cap. 32. HILDANUS Cent. III. Obſ. 43. RUYSCHII, Obſ. 38. VAN HORNE & LANCISI, loc. cit.

[o] Thus SENNERTUS (Præx. Med. Lib. V. Part. I.) gives the Caſe of a Woman who ſuſtained an Aneuriſm the Size of a Walnut on the Flexure of the *Cubitus*, without any Detriment, for the Space of thirty Years.

[p] Cent. III. Obſ. 44. [q] Obſ. Chirurg. 2.

that

that by Inciſion, as well in the incipient true as in the ſpurious Aneuriſm; for it would be barbarous to ſubject the Patient to a cruel Operation, for what may be remedied by a milder Treatment. The Patient may be therefore relieved, and the Tumor diminiſhed by Compreſſion, after diſcharging the extravaſated Blood, either with a Compreſs of chewed Paper, or a bit of aſtringent Plaſter, retained with the other Compreſſes and Bandage we deſcribed in the preceding Chapter; by which means the Diſorder may be conſiderably diminiſhed, if the Deligation be continued on the Limb for ſeveral Weeks or Months: And thus we read of Cures performed as well formerly by HILDANUS (*Cent.* III. *Obſ.* 44.) TULPIUS (*Obſ. Med. Lib.* IV. *Cap.* 17.) ROGERUS, (*Zod. Med. Gall.* 1681. *p.* 43.) and others of the laſt, as well as of the preſent Century. But if Deligation be found inſufficient, as it was upon the *French* King's Phyſician, M. BOURDELOT (*Zod. Med. loc. cit.*) Recourſe muſt then be had to a particular Machine adapted to the Purpoſe of compreſſing the Aneuriſm, which, if ſmall, may, by the Aſſiſtance of that Inſtrument and a ſtrengthening Plaſter, be compleatly cured. Among the ſeveral Inſtruments contrived for this Purpoſe, we have ſelected the two repreſented in *Tab.* XI. *Fig.* 8. *and* 9. the Uſe and Application of which may be better underſtood from Inſpection, than a verbal Deſcription: We have alſo, in my Opinion, ſufficiently explained it in our Expoſition of *Tab.* XI. [r].

VII. If the Aneuriſm is too large to receive any Benefit from Compreſſure by Deligation, or the preceding Inſtrument, or if a true Aneuriſm ſhould, by a Rupture of the arterial Coats, degenerate into a ſpurious one, attended with a livid Tumor from the extravaſated Blood, Immobility of the Arm, intenſe Pain, and the Danger threatened from an accidental or profuſe Hæmorrhage; in that Caſe the Patient can have no Relief, but from the Operation by the Knife; which Operation, however, being attended with much Pain and Danger, ought not to be undertaken without great Care and Circumſpection, and with the Approbation or Advice of other eminent Phyſicians and Surgeons; leſt, if the Succeſs thereof ſhould turn out worſe than expected, it might be raſhly attributed to Imprudence or Miſconduct in the Operator. Treatment of large Aneuriſms.

VIII. There are chiefly two things required in the Operation, *viz.* firſt a Removal of the Tumor or Aneuriſm, and then to conjoin or heal up the Wound in the Artery. In the laſt Century they uſed to amputate the Arm for an Aneuriſm in *Italy*, and then applied an actual Cautery to the divided Artery, as we are told by BARTHOLIN, in his *Hiſtor. Aneuriſmat.* But at preſent we endeavour to preſerve the Patient's Arm, and remove the Aneuriſm by a much milder Treatment. For the ſucceſsful Performance of this Operation, the Surgeon muſt attend chiefly to three things; firſt to ſtop the Flux of Blood through the Artery by the *Tourniquet*, an Inſtrument unknown to the Ancients; ſecondly to denudate the Artery, and free it from the adjacent Integuments; and, laſtly, What is required in the Operation.

[r] SCULTETUS alſo deſcribes and figures an Inſtrument for this Purpoſe in his *Armament. Chirurg. Edit.* 4to. *Ann.* 1666. *Tab.* XIX. *Fig.* 4. But his does not ſeem ſo well adapted as ours. DIONIS likewiſe mentions the Inſtrument contrived and uſed by Dr. BOURDELOT (deſcribed at large in BLEGNI's *Zod. Med. Gallic.* 1681. *pag.* 43.) for himſelf, by which *Ponton* or Bridge, he relates that, within the Space of a Year, he was cured of an Aneuriſm in his Arm as big as a Pullet's Egg.

to contract or conſtringe the ſame, either by Medicines or Ligature[a]. It will therefore firſt be neceſſary to have all the proper Inſtruments conveniently diſpoſed in readineſs in a large Plate or Diſh, that there may be no Delays in the Operation. This *Apparatus* muſt take in a *Tourniquet*, to compreſs the brachial Artery, (*See* Part I. Book I. Chap. II. Sect. IX. *and* X. *& ſeq. ad* XV.) a *Scalpel*, *Tab.* I. G. and a Hook, *Tab.* VIII. *Fig.* 2, *and* 3. to denudate the Artery; to which add a Sponge with ſome warm Wine or its Spirit, a Pair of obtuſe pointed Sciſſors, *Tab.* I. C or D, ſome ſcraped Lint, ſquare Compreſſes of ſeveral Sizes, one narrow Compreſs of a Span in length, with two large Pieces of Linen to inveſt the Arm; and, laſtly, two or three Rollers of two Fingers breadth, and thrice as long as for *Phlebotomy* in the Arm. But if the Artery is to be contracted by Aſtringents or Cauſtics, the Succeſs of which is very dubious and uncertain, you muſt then enlarge your *Apparatus* with ſome *Vitriolum Romanum*, *Butyrum Antimonii*, *&c.* or if you ſecure the Artery by Ligature, which is the ſafeſt and univerſal Practice of the Moderns, (becauſe the Eſchar made by Cauſtics has been often obſerved to give way, and excite a fatal Hæmorrhage) inſtead of Aſtringents or Cauſtics, you muſt then provide a crooked Needle armed with ſome ſtrong waxed Thread, twice or thrice doubled; or, inſtead of a Ligature by a Needle and Thread, you may apply the particular Inſtrument invented by me for this Purpoſe, and repreſented in *Tab.* VIII. *Fig.* 4.

How the Patient and Aſſiſtants are to be diſpoſed.

IX. Your *Apparatus* being prepared, the Patient is next to be ſeated in a Chair, leaning back with his Arm extended, in the ſame manner as for *Phlebotomy*; then you muſt place four Aſſiſtants round him, in the moſt advantageous Poſition; and when the Aneuriſm is in the right Arm, it is, in my Opinion, beſt for the Surgeon to ſtand on the right Side of the Patient, placing the moſt expert of the Aſſiſtants next him, to hold the diſordered Arm above the Tumor, together with the *Tourniquet* applied to it, that he may encreaſe or diminiſh his Stricture on the Arm by that Inſtrument, as the Surgeon ſhall direct. One of the other Aſſiſtants ſtanding before the Patient, is to hold the Arm faſt by the *Carpus*, that he may not flinch, or withdraw it in the Operation; a third Aſſiſtant is to ſtand on the left Side, holding the *Apparatus* of Inſtruments; and the fourth, or laſt Aſſiſtant, muſt be ready to do any thing the Surgeon may find neceſſary to direct him, during the Operation. But if the Aneuriſm is in the left Arm, the Surgeon and Aſſiſtants are to be diſpoſed in the reverſe Order, as any one may eaſily direct.

Application of the *Tourniquet*.

X. The firſt Part of the Operation conſiſts in applying the *Tourniquet* about the middle or upper Part of the *Humerus*, ſo as thereby gradually to compreſs the brachial Artery, (ſee *Tab.* III. *Fig.* 1. K) till you can perceive no Pulſation either in the Artery at the *Carpus*, or in the Aneuriſm itſelf; by which means you will be ſure to avoid any conſiderable Hæmorrhage: But you muſt be careful to moderate your Stricture by the *Tourniquet*, ſo as not to injure the Nerves, or other ſenſible Parts. The Stick by which the *Tourniquet* is twiſted muſt be held by an Aſſiſtant on the right Side; or if you uſe the Screw *Tourniquet* repreſented in *Tab.* V. and VI. that will remain faſt on the Arm, with-

[a] Surgeons formerly cloſed the Artery by cauteriſing with a red-hot Iron; but that is a Method too cruel, and is at the ſame time not ſecure, and often has pernicious Effects.

out

out holding. But it ſometimes happens, as GARENGEOT obſerves in his Surgery, *Chap.* . on *Aneuriſms*, that the *Tourniquet* cannot be ſafely applied to the Arm in a ſpurious *Aneuriſm*, by reaſon of the great Extravaſation and Tumor. In that Caſe you may therefore, as the Author directs, apply the *Tourniquet* over a Ball and Compreſs in the *Axilla*, ſo as to compreſs the Artery, by twiſting the Stick of the *Tourniquet* above upon the Shoulder.

XI. When the *Tourniquet* is properly fixed and tightened upon the Arm, there are then three Methods of performing the Operation; the firſt of which is, by laying open the true *Aneuriſm* by a longitudinal Inciſion, continued upward and downward by the *Scalpel*, according to the length of the compreſſed Artery; which done, you are to remove the vitiated Blood or Matter therein lodged, either by your Fingers, the Probe, or a Sponge. The Parts being thus cleanſed, you muſt, in the next place, ſlacken the *Tourniquet* a little, that the ſalient Blood may demonſtrate the upper Orifice of the Artery to you; and in doing this, you need not conſtringe your *Tourniquet* again immediately, if the Patient be ſtrong, and of a full Habit; but rather permit the Artery to diſcharge a few Ounces of Blood, more or leſs, as may be thought proper. When you have again tightened your *Tourniquet*, ſo as to exclude the leaſt Hæmorrhage, if your Intention is to treat the Diſorder by Cauſtics and Styptics, you muſt inſert a bit of blue Vitriol, wrapt up in Cotton or Lint, into the upper Orifice of the Artery, ſecuring it there by ſeveral ſmall Compreſſes, each a little larger than the other, filling up the reſt of the Space on all Sides with rude Bundles of Lint; you muſt then make a ſtrict Bandage over all the Fingers, and eſpecially the Thumb, with the affected Artery of the diſordered Arm. Inſtead of intruding a Piece of Vitriol into the Orifice of the Artery, you may apply a Doſſil of Lint dipped in, and expreſſed out of the Styptic Liquor of WEBERUS, or in Butter of Antimony; the Effect of which, being ſecured with Compreſſes and Lint as before, will be equal to, if not better than the firſt we propoſed. Over the Dreſſings muſt be applied a ſquare Plaſter, and a large Compreſs of the ſame Form, to be cloſely retained by a Bandage, three or four times as long as is commonly uſed for *Phlebotomy* in the Arm. M. DIONIS makes his Deligation without the Piece of Vitriol, for which he ſubſtitutes a Lump or two of chewed Paper, or Lint, dipped in ſome Stypic, which he covers with ſeveral ſmall Compreſſes, each larger than the other, and ſecures the whole upon the inciſed Artery by Deligation; which Method of dreſſing may, in many Caſes, be convenient and proper enough.

First Method of Operating.

XII. But in order the more effectually to prevent a future Hæmorrhage, it will be neceſſary to apply another Bandage over the former; and, after making ſome circular Rounds with it upon the Part affected, it is to aſcend up the Arm upon the long Compreſs impoſed on the brachial Artery on the inſide of the Arm, as we directed in the preceding Chapter. That this laſt Bandage may adhere more firmly, it will be neceſſary to paſs it round the *Thorax*, when arrived to the Shoulder, and to faſten it off upon the Arm, diſpoſing the Patient to Reſt. When your Dreſſings are thus compleated, you muſt obſerve whether any Blood iſſue through the Bandage; and if there be no appearance of any, it is a Sign your Operation is well performed.

Treatment after Deligation.

Procedure in Caſe of an Hæmorrhage.

XIII. But if you perceive any Blood ooze through the Dreſſings, the Artery muſt be again compreſſed by the *Tourniquet*, your Dreſſings taken off, and re-applied with more Care and Exactneſs; or elſe a more certain Method taken to ſecure the End of the Artery, by Ligature, with a crooked Needle and a double waxed Thread, which is the only infallible means of defending the Patient from a fatal Hæmorrhage, and was formerly propoſed by PAULUS AEGINETA[r], one of the moſt ancient among the *Greek* Phyſicians. But in making this Ligature, the Surgeon muſt have a principal Regard to two things; that is, he muſt avoid injuring both the Artery itſelf and the adjacent Nerve; in order to which, it will be moſt convenient to make your external Inciſion through the Integuments ſufficiently large, and then carefully to ſeparate the Nerve from the Artery, to which it is attached, by a ſmall Hook; and then to paſs the Head, or obtuſe End of the Needle, foremoſt under the Artery, till you can take hold of the Thread, that its Point may not hurt either that Veſſel or the Nerve; or elſe, inſtead of a Needle, you may paſs your Ligature under the Artery, by the Inſtrument which I contrived for that Purpoſe in *Tab.* VIII. *Fig.* 4. C; which Inſtrument is to be withdrawn when your Ligature is opened and drawn a ſufficient length from under the Artery, which is then to be tied with it upon a thin Compreſs of ſcraped Lint, with which you are to defend or inveſt the Artery before the Conſtriction of your Ligature. The Artery being thus ſecurely tied up, you leave about a Hand's breadth of the Thread or Ligature hanging out of the Wound; in which manner it is to continue till the Artery is cloſed, and the Ligature comes off ſpontaneouſly. There are ſome Surgeons who alſo direct the lower Orifice of the inciſed Artery to be ſecured by a Ligature as well as the upper; and there are others again who think the ſame to be uſeleſs, or even miſchievous, as indeed it may be, when the Diſorder being in the Flexure of the Arm, the larger Inciſion and Cicatrix this way made, will in ſome meaſure impede or ſtiffen the Motion of the Joint. But if the *Aneuriſm* be not in the Joint, or in the lower Part of the *Cubitus*, and you perceive Blood to iſſue from the lower Orifice of the divided Artery, then you may, and even ought to make a ſecond Ligature below as well as above: And thus, after I had tied the upper Orifice in an *Aneuriſm* of the cubital Artery, upon relaxing the *Tourniquet*, I perceived Blood ſtart from the lower Orifice, which I therefore ſecured like the other, by tying it with a crooked Needle and ſtrong Thread; ſo that by their aſſiſtance, with the application of Balſams, I happily cured the Patient, though a little before in very great Danger of Death. In the ſame manner you muſt alſo make a Ligature both above and below, even in the Flexure of the *Cubitus*, if you thus find it neceſſary; or at leaſt you muſt compreſs the lower Orifice of the Artery by a proper Bandage and Compreſſes; in which Method I once accompliſhed my Cure of this Diſorder, without making a Ligature below. When the Artery has been thus ſecured by Ligatures, it is a common Practice

[r] *Lib.* VI. *de Re Medicâ, Cap.* XXXVII. where he ſays, If a Tumor or *Aneuriſm* is formed from an Injury of the Artery, we make a longitudinal Inciſion through the Integuments; and, dilating the Lips of the Wound by Hooks, we denudate the Artery, under which we paſs a Needle and double Thread, tying it above and below: The intervening Part of the Artery betwixt the Ligatures we lay open by Inciſion, and, after diſcharging the Contents, we ſuppurate till the Ligatures are digeſted off.

with

with ſome Surgeons to divide it tranſverſly a little beneath the Ligature, that the contracting or receding of the Artery into the Fleſh may compreſs its Extremities, and the better prevent a conſequent or dangerous Hæmorrhage: But in my Opinion that Practice is improper, or at leaſt it is unneceſſary, as I have twice ſucceſsfully performed this Operation, and happily cured the Patients of their *Aneuriſms* without thus dividing the Artery. Laſtly, you are to fill the Wound well with ſcraped Lint, to be firmly ſecured by Compreſſes and a ſtrict Bandage, as we before directed, and as we ſhall more largely explain and demonſtrate in our third and laſt Part of Surgery or Bandages.

Method of preventing an Inflammation.

XIV. In the next Place it is a common and no improper Practice with ſome Surgeons to guard againſt an Inflammation by laying Linen Compreſſes dipped in Oxycrate, on each ſide the affected Parts of the Arm, to be retained by a ſpiral Bandage, and then to bleed the Patient in another Part; which may be very neceſſary Precautions in Patients of a warm and full Habit. But *Phlebotomy* with thoſe cooling Applications will be pernicious in ſuch as are of a cold Conſtitution, and have before loſt much Blood in the Operation or otherwiſe, notwithſtanding the *French* recommend that Treatment to be generally followed without any Reſtriction: For I have myſelf cured ſeveral in which I not only omitted Bleeding and the Oxycrate, but even uſed warm Applications of *Sp. Vini calid. Camphorat. cum Theriacâ.* Your Deligation or Dreſſing being thus compleated, the Patient is to be put to Bed, and his Arm laid in an eaſy or a little inflected Poſture upon a Pillow, and the Patient is to be ordered at the ſame time to move himſelf as little as poſſible, in order to reſtrain the Impulſe of the Blood from the Heart on the affected Artery. If you ſhould perceive the Arm to ſwell violently, and threaten an Inflammation, leſt it ſhould be occaſioned by too great a Stricture of your Bandage, you muſt take it off and apply it again as we directed at N° XII. preceding. But for a ſmall Tumor or other ſlight Symptoms you ſhould not haſtily remove your Bandage, for fear of a profuſe Hæmorrhage, eſpecially as Experience teaches that even a livid Swelling of the Arm may be ſuſtained in theſe Caſes without any bad Conſequence, provided the Swelling be not over painful or tenſe, nor infeſted with any of the Symptoms of a Gangrene; under which Circumſtances we have directed you to a Method in the preceding Chapter.

How to prevent an Hæmorrhage.

XV. But in order to prevent a fatal Hæmorrhage, when the Cure of an *Aneuriſm* is attempted by Aſtringents or Cauſtics only, without making a Ligature on the Artery, it may be proper for an Aſſiſtant conſtantly to attend and lie by the Patient, provided with a *Tourniquet* and the Method of applying it, to compreſs the Artery in caſe of ſuch an Accident, till the Surgeon can be called to make a Ligatnre on the Veſſel by a crooked Needle and double Thread. But ſuch an Accident is, in my Opinion, beſt prevented at firſt by taking up the End of the inciſed Artery with a Needle and Thread, rather than to truſt to the Uncertainty of a Conſtriction or Eſchar made by Cauſtics. It is alſo a prudent Practice of ſome Surgeons to arm their Needle with three Threads, which being paſſed under the Artery, two of them are tied and the other left looſe to be faſtened afterwards by itſelf when the other Threads are relaxed ſo as to permit a freſh Hæmorrhage.

Management of the Dreſſings.

XVI. With regard to the Bandage and Dreſſings, if they adhere firmly upon the Parts, they ought not to be removed on any ſlight Occaſion, before the third or fourth Day, except a great Inflammation, Tumor, or Hæmorrhage ſhould

make it neceſſary to renew the ſame; and then the Surgeon muſt take Care that the *Tourniquet* be duly applied and fixed upon the Arm, or elſe the Artery compreſſed by the Fingers of an Aſſiſtant before he proceeds to take off the Bandage and Dreſſings; and even then he ought not violently to force off the Compreſſes if they adhere, which might bring on a profuſe Hæmorrhage, but rather let them remain, and having cleanſed the Wound as much as poſſible, to fill it with freſh Lint armed with ſome digeſtive Ointment, leaving ſuch Parts as adhere to be ſpontaneouſly ſeparated, in the ſucceeding Dreſſings, which in this Diſorder ought to be repeated as ſeldom as poſſible, eſpecially within the firſt fifteen Days, and then it ſhould be made with all the neceſſary Cautions to prevent a Rupture of the Artery and a profuſe Hæmorrhage.

Treatment of Inflammatory Heats, Fevers, and other Symptoms.

XVII. If within a few Days after the Operation the Patient is ſeized with an Inflammation or Fever, from the intenſe Heat and increaſed Motion of the Blood, threatening an Hæmorrhage or a Gangrene in the affected Arm, the Patient muſt then be inſtantly bled in the other Arm; in the mean time a cooling Regimen and Medicines are to be uſed, and *Phlebotomy* again repeated in proportion to the Patient's Habit and the Urgency of the Symptoms. The Diet ſhould be light, ſpare and cooling, conſiſting chiefly of ſmall Broths and diluent Suppings, induſtriouſly avoiding all hard and ſtimulating or heating Food, as is uſual in large Wounds and other Inflammations.

Agglutination of the Wounds.

XVIII. When the Orifice of the Artery is cloſely conſolidated or united, which in common *Aneuriſms* uſually ſucceeds in ten Days or a Fortnight's Time, your Buſineſs is then to agglutinate or heal up the external Wound in the Integuments, by treating it either with dry Lint or vulnerary Balſams, obſerving in the mean time to make the Patient gently bend and extend his Arm at Intervals; without which Precaution he may be troubled with an obſtinate Rigidity or Stiffneſs of the Joint, and an Incurvation of the Arm, partly for want of attenuating and diſperſing the *Synovia*, or Mucilage of the Joint, by repeated Motions, and partly from not ſtretching or extending the Cicatrix as it becomes gradually formed and more indurated.

Purman's Method of operating.

XIX. Another Method for curing *Aneuriſms* is by fixing the *Tourniquet* on the Arm, as we before directed, then making an Inciſion through the Integuments, without touching the *Aneuriſm*, and having freed the diſordered Artery from its Adheſions to the adjacent Nerves, it is then elevated by a Hook ſufficient to paſs a crooked and obtuſe pointed Needle under it, or our Inſtrument, *Tab.* VIII. *Fig.* 4. armed with a double waxed Thread: by the tying of which Thread the Artery is conſtringed or cloſed, but in ſuch a manner that you muſt always place a ſmall Compreſs of Lint upon the Artery under the Knot, leſt it ſhould cut or break through the Coats of that Veſſel. The Artery being thus tyed above and below the *Aneuriſm*, the Tumor is next laid open by Inciſion betwixt the two Ligatures, its Contents diſcharged, and the Wound then treated as we before directed in N°. XVI. *& ſeq.* And this laſt is the Method Purmannus followed in the Cure of that large *Aneuriſm* which he mentions, *p.* 212 of his *Chirurgia curioſa*, compleating the Cure, and healing up the Wound within the Space of a Month. We have given the Figure of this monſtrous large *Aneuriſm* in *Tab.* XI. *Fig.* 6. partly for its Uncommonneſs, and to illuſtrate the Nature of the Diſorder, and partly to refute the Opinion of Gourius [a], *viz.* That a true *Aneuriſm* never exceeds the Size of a Cheſnut.

[a] See his *Chirurg. pag.* 23. 1.

XX. The

XX. The third and laſt Method of performing the Operation for the true *Aneuriſm*, is by returning or preſſing back the Blood out of the *Aneuriſm*, into its correſponding Artery, which however, being concreted in large *Aneuriſms*, is a thing impracticable [b]: Then the *Tourniquet* is applied to the Arm, and a longitudinal Inciſion made through the Integuments as before, without at all injuring the *Aneuriſm* itſelf by the *Scalpel*. This done, and the Artery freed from its Adheſions to the Nerve and Parts adjacent, it is then compreſſed by Ligature with a Needle and Thread as before, only without making any Inciſion in the Artery afterwards: By which means the Blood is prevented from returning into the *Aneuriſm* or diſtended Part of the Artery: You are then to treat the Wound with Digeſtives, as before, till the Ligatures and morbid Part of the Artery are caſt off ſpontaneouſly; after which you may heal and cicatrize as we before directed. This is the Method by which ANELIUS happily cured a very dangerous *Aneuriſm* within the ſpace of a Month, at *Rome:* Which he prefers, as one may hereby avoid the making a large Wound and Cicatrix, which are the conſtant Attendants of opening the *Aneuriſm* by Inciſion, and diſcharging its contained Blood either by the Fingers or Inſtruments: Which greatly protracts the Cure of the Diſorder, as well as renders it more painful and attended with a diſagreeable and uneaſy Scar. After the Operation is performed as above, ANELIUS bled the Patient four times in the oppoſite Arm; to which add that repeated *Phlebotomy* is recommended by all the other *French* Surgeons who have treated on this Diſorder. But though ſuch repeated bleeding may be of great Service in abating the Motion and *Impetus* of the Blood, in their warm Climate and Conſtitutions; yet in our more northern or colder Countries or Conſtitutions I think it may be very well omitted, as it would too much weaken the Patient, and as I have happily cured ſeveral *Aneuriſms* without it.

A third Method by ANELIUS.

XXI. If, as I have ſometimes obſerved, the Coats of the true *Aneuriſm* ſhould burſt ſpontaneouſly, ſo as to extravaſate the Blood, it then degenerates into a ſpurious *Aneuriſm*, for which there is no Cure but by the Knife. Here therefore you muſt firſt of all apply the *Tourniquet* to compreſs the Artery and prevent an Hæmorrhage, you muſt then make an Inciſion through the Integuments ſufficient to diſcharge what concreted Blood may have been extravaſated and intercepted; which done, and the Wound well cleanſed, you muſt ſecure the Artery with a Ligature, with a Needle and Thread, as in the true *Aneuriſm*, dreſſing and healing up the Wound as we have before largely directed.

Treatment of the ſpurious *Aneuriſm*.

XXII. Whenever you meet with the brachial, cubital, or tibial Artery, wounded either by a Dart, Sword, or other Inſtrument, ſo that the Hæmorrhage thence proceeding cannot be ſuppreſſed either by Bandage or Remedies, there is then no Method of ſaving the Patient ſo certain and expeditious as this here propoſed for *Aneuriſms*; that is, you ought firſt to apply the *Tourniquet*, then denudate the Artery; and, if it be very ſmall, to treat it with Cauſtics or Aſtringents; but if large, to ſecure it by Ligature with a Needle and Thread, as we before directed: For I may, without boaſting declare, many are the Patients that have, with my own Hand, been by this means, as it were, ſnatched from the Jaws of Death: I have even recovered thoſe by Ligature, who have been almoſt ſpent and exhauſted, ſo as to look like Death, through the fruit-

The Ligation of other Arteries in the ſame manner.

[b] And therefore when the Blood cannot be returned out of the *Aneuriſm* this Method will not ſucceed, but one of the former muſt be uſed.

leſs

leſs Attempts of the Surgeons, continued for ten or twelve Days together by Styptics and tight Bandage, which had occaſioned their Limbs to ſwell to an enormous Size. But whether or no this Method will ſucceed, ſo as to ſave the Limb, in Wounds of the large crural Artery, I have never yet had an Opportunity of experiencing, nor did I ever hear or read of it attempted by others.

Aneuriſms in the Head, Hands, and Feet.

XXIII. In the Method we have here preſcribed, you ought alſo to treat other *Aneuriſms*, when they are curable; which may be determined partly from conſidering the Size and Situation of the Artery, and partly from the Size and Nature of the *Aneuriſm* itſelf. But, for the ſake of Beginners, I ſhall be a little more particular in my Account of other *Aneuriſms*, and the rather, becauſe it is a Subject of which moſt of our modern Surgeons take little or no notice. And firſt, an *Aneuriſm* of the Artery betwixt the Thumb and fore Finger, occaſioned by a Puncture from a Penknife, was cured by Compreſſion, as we are told by *Tulpius* (*Lib.* IV. *Obſ.* 17.) which Compreſſion he made by applying firſt an aſtringent Plaſter, over that a Plate of Lead, and then, by a ſtrict Bandage, having firſt returned the Blood out of the Tumor, the Diſorder was cured within the Space of four Months. The ſame Treatment or Compreſſion may be therefore uſed in moſt other *Aneuriſms*, eſpecially thoſe which are recent, and not large, after having firſt returned or diſcharged the Blood contained in the *Aneuriſm*. A Woman ſtruck her Son, of ſeven Years old, ſuch a Blow on the left Side of the Head with a Stick, that, by contuſing the carotid Artery, a beating Tumor was inſtantly formed, about the Size of a Hazle-nut, which, in the ſpace of eight Days time, grew ſo large as to cover half or one ſide of his Head, from the ſagittal Suture all over the Temple and Forehead, to the Eye. Upon her coming for Advice, it was thought proper by the Surgeons to prefer the Operation, though a doubtful Remedy, rather than leave the Patient to the more certain Hazard of his Life; the Tumor was therefore laid open by the *Scalpel*, the contained Blood diſcharged, and the Wound dreſſed with Aſtringents and tight Bandage; by which means the Patient recovered in a ſhort time. Thus alſo was cured an *Aneuriſm* of the Artery behind the Ear, in proceſs of time, though with much difficulty, by the uſe of Aſtringents and tight Bandage. If an *Aneuriſm* ſhould ariſe near the Ancle, like that deſcribed by RUYSCH, *Obſ.* 38. which was opened by an imprudent Operator for an Abſceſs, you ought either to make an Inciſion through the Integuments and Tumor, and to apply Aſtringents with a tight Bandage, or elſe to denudate the Artery, and ſecure it by Ligature with a Needle and Thread, as we directed before. Hence you may be alſo able to treat *Aneuriſms* formed in any of the other acceſſible Arteries of the Body, where there is any Proſpect of obtaining a Cure. HARDERUS *Apiar. Obſ.* p. 325. takes notice of a Patient's ſudden Death, from opening an *Aneuriſm* of the carotid Artery in the Neck; and VAN HORNE has obſerved the ſame from the Apertion of an *Aneuriſm* in the Thigh. *V. Epiſt. de Aneuriſmate.*

Some Obſervations on the Diſorder.

XXIV. They who deſire a better Idea of the manner in which the Ligatures are to be made upon the Artery for an *Aneuriſm*, may inſpect *Fig.* 7. in our ninth Table, where A denotes that Part of the Artery above the *Aneuriſm*, B the part below, C the *Aneuriſm* itſelf, D the ſuperior Ligature, and E the inferior one. But here we may again obſerve, that when the Tumor is on

the Flexure of the Arm, the lower Part of the Artery should not be tied with a Ligature, except it be absolutely necessary, for the reasons we before alledged. But in what manner the Circulation of the Blood is carried on through the Hand and lower Parts, after the Operation, I cannot conceive, especially when there is but one Trunk of the brachial Artery near the Elbow, as must have been the Case with the Patient of ANELIUS, because no Blood returned by the lower Part of the Artery, after its Division, into the Tumor, notwithstanding he did not secure it by Ligature; we must therefore defer our Enquiry on this Head, till some body may have an Opportunity of examining the Arm of a dead Subject who has undergone this Operation in his Life-time. Dr. WALTER HARRIS, in his eighth chirurgical Dissertation, openly condemns this Operation, and calls it dreadful and rash Butchery; but for what reasons himself best knows. He seems, in my Opinion, to have been a very timorous Physician, who, out of Fear, or a foolish and ill-grounded Compassion, is for rejecting some of the most considerable and useful Operations in Surgery; without which, it will be impossible for the Patient to obtain a Cure, or even to survive any time.

CHAP. XIV.

Of injecting Liquors into the Veins, and of transfusing the Blood of one Animal into another.

I. WE treat next of *injecting* and *transfusing*, as a Branch of Surgery, because those Operations require the apertion of a Vein, in the same manner as in Bleeding. The first is the injecting some Liquor or Medicine into a Vein opened by Incision; and the last is the conveying the arterial Blood of one Man or Animal into the Veins of another. Notwithstanding these Operations are seldom practised by our modern Surgeons, yet they were highly celebrated, and often performed, in the last Century, from the Year 1660 to 1680; and therefore we shall not think much of our Endeavours here, to give the young Surgeon a clear Notion of the affair, from whence he may also be able to understand what reasons gave occasion for the first Invention and Permance thereof, and what Advantages may be perhaps reasonably expected from the same Operations even at the present Day. The Operations described.

II. The generality of Physicians not without reason attribute most Disorders of the Body to some Vice in the Blood; and therefore what Method can be more ready to remove or correct that Vice, than injecting a proper Medicine into the Veins to mix with the Blood itself, or the transfusing the sound Blood of one Man or Animal into the Veins of another, instead of that which is diseased. For by this means the Action of a Medicine on the Blood will be immediate and entire, without being impaired or changed by passing the Stomach and Intestines, and mixing with various Juices before it arrives to the Veins. But there are even many Cases which occur, wherein no Medicine at all can be taken by the Mouth, as in Apoplexies, Angina's, the *Hydrophobia*, *&c.* which may possibly be this way remedied, when they cannot by any other. And if plentiful Bleeding is so serviceable in many Disorders, as the Leprosy, Gout, Uses expected from them.

Gout, Epilepſy, Apoplexy, Conſumptions, Scorbutus, Venereal Diſeaſe, malignant Fevers, *&c.* by diſcharging the peccant Matter in the Blood, as it is by many Phyſicians allowed; even the Objections of other Phyſicians againſt it, as weakening the Patient, *&c.* may, by theſe Operations, be obviated or removed. Even old Age may be ſupported, and the very worſt Habits of Body corrected by theſe means, ſo as to give a firm, juvenile, and healthy Conſtitution. Theſe, and ſuch like, are the vaſt Expectations which have been formed from the preſent Operations by Phyſicians; but the Misfortune is, that they not only meet with Diſappointment in their good Views, but even frequently the Event turns out worſe than the Diſeaſe. For almoſt all the Patients who have been this way treated, have degenerated into a Stupidity, Fooliſhneſs, or a raving or melancholy Madneſs, or elſe have been taken off with a ſudden Death, either in or not long after the Operations. Theſe lamentable and fatal Conſequences have brought the Art of *Injections* and *Tranſfuſions* into Neglect at the preſent Day; ſo that, being ſuſpected and condemned by proper Judges at *Paris*, where they moſt flouriſhed, we are told they were in a little time prohibited by a public Edict of that Parliament.

The Art of *Injection* deſcribed.

III. Notwithſtanding this, we ſhall give the young Surgeon an Idea of the manner in which Liquors were formerly, and may now be injected into the Veins of living Men, or other Animals. And firſt, a Vein is to be opened, uſually in the Arm, by your Lancet, as in Bleeding; and having introduced the ſmall Pipe of a Syringe, or a very ſmall Clyſter-pipe with a Bladder (*Tab.* XI. *Fig.* 10.) the contained Liquor is injected or forced into the Vein upwards towards the Heart; which done, you are to dreſs the Orifice, and make your Deligation upon the Arm in the ſame manner as after *Phlebotomy*. But whether or no this Method of injecting proper Medicines into the Blood may not ſucceed, eſpecially in deſperate Apoplexies, Angina's, *Hydrophobia*, *&c.* and whether it may not be often uſeful to diſcharge the morbid Blood, and transfuſe ſuch as is ſound, or warm Milk or Broth in its ſtead, ought, in my Opinion, to be determined by future and repeated Experiments. PURMANNUS in his Surgery (Part III. Chap. 31.) tell us, that he has not only performed the Operation with Succeſs on others, but alſo very happily upon himſelf, being by this means cured not only of a troubleſome Itch, but alſo of a ſtubborn Fever. A profeſſed Treatiſe on the Subject has been publiſhed by ELSHOLTZ, intituled, *Clyſmatica Nova, ſive Chirurgia, Infuſoria & Transfuſoria*, 8vo, 1667. *Editio ſecunda, cum Fig.*

The Method of *Tranſfuſion.*

IV. For the Transfuſion of Blood into the Veins, you are firſt to open a Vein in the Patient's Arm or Hand, as at *Fig.* 11 and 12, *Tab.* XI. and then thruſt gently upward into it a ſmall Tube of Silver, Braſs, or Ivory: The ſame is to be alſo done with the ſound Perſon, only the Tube muſt here be inſerted downward towards the ſmall End of the Vein. This done, the ſmalleſt of the Tubes is to be inſerted into the other larger one, by which means as much Blood will paſs from the ſound Perſon into the Patient as may be thought proper, and then the inciſed Veins are to be dreſſed or bound up as in Bleeding; but if the Patient does not recover after one Transfuſion, the Operation ſhould be repeated again at convenient Intervals. But before the Patient receives the Blood of the ſound Perſon, he ought to be bled proportionably, that the new Blood laſt received may have the freer Circulation. Sometimes a

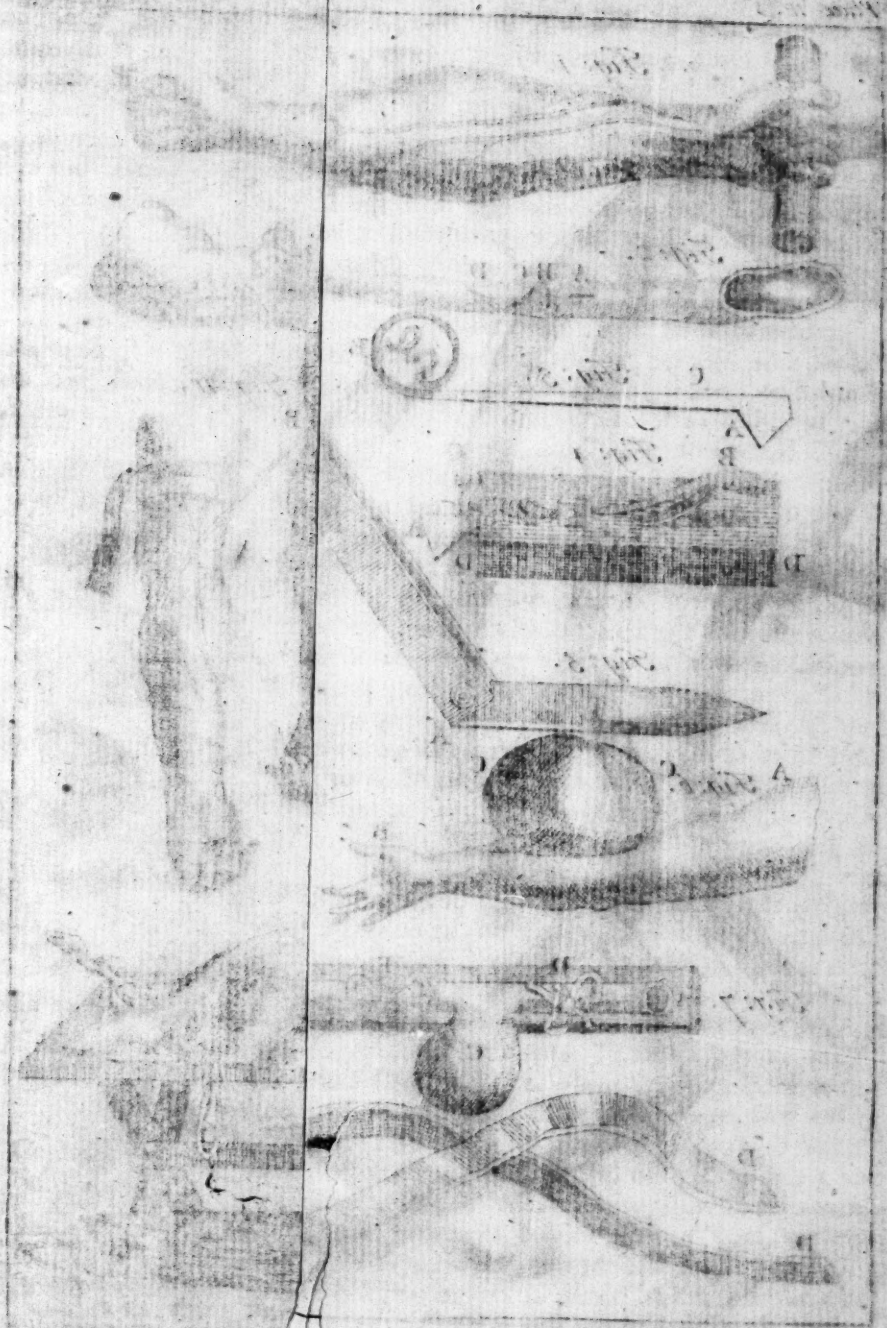

Plate II.

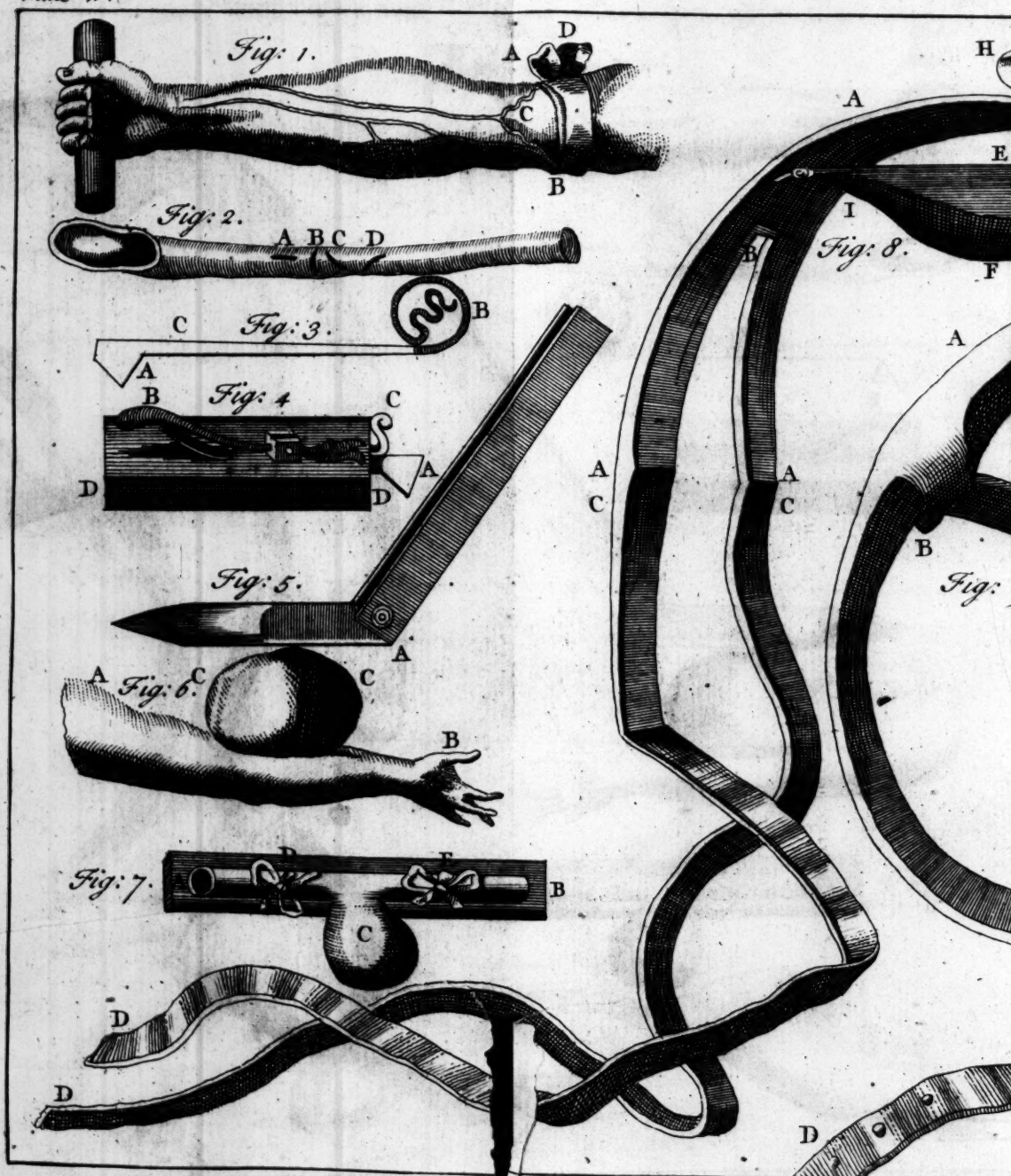
Fig: 1.
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Fig: 2.
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Fig: 3.
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Fig: 7.
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Fig: 8.
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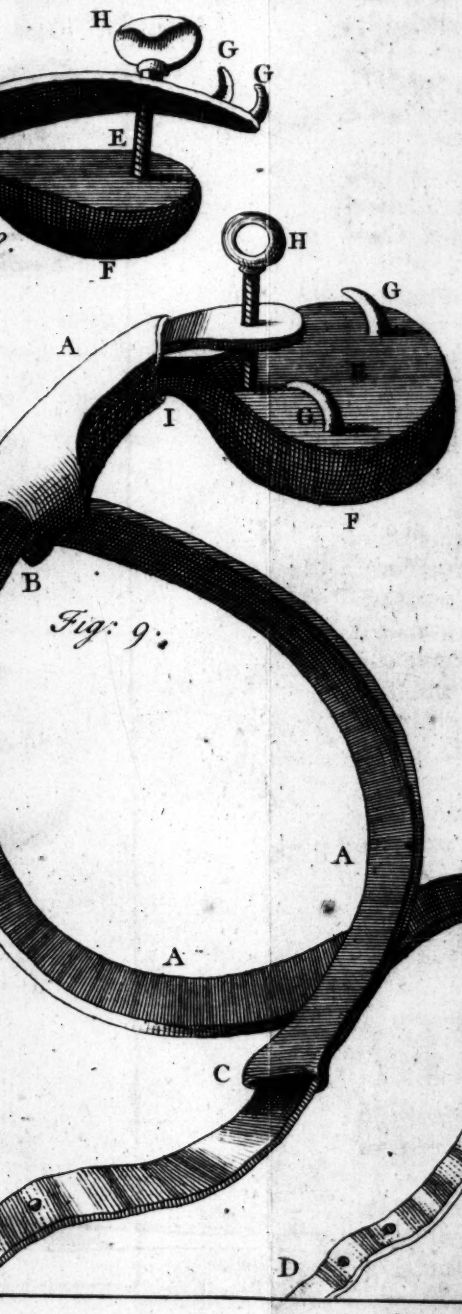

Fig: 9.

Fig: 10.

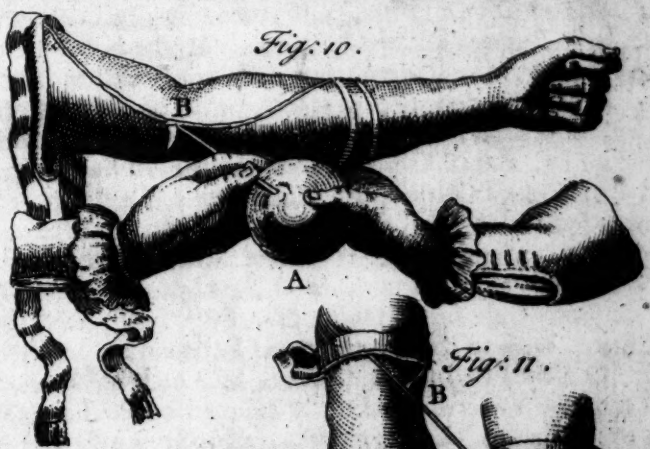

Fig: 11.

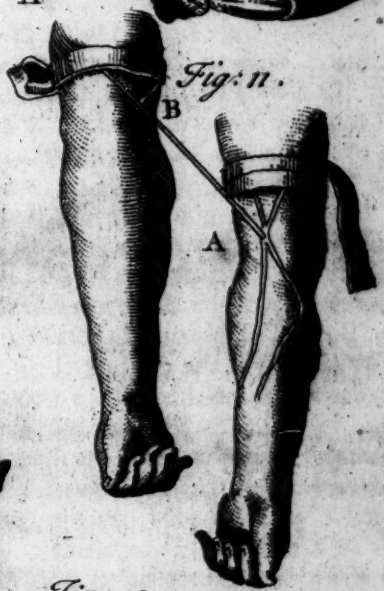

Fig: 12.

Fig: 13.

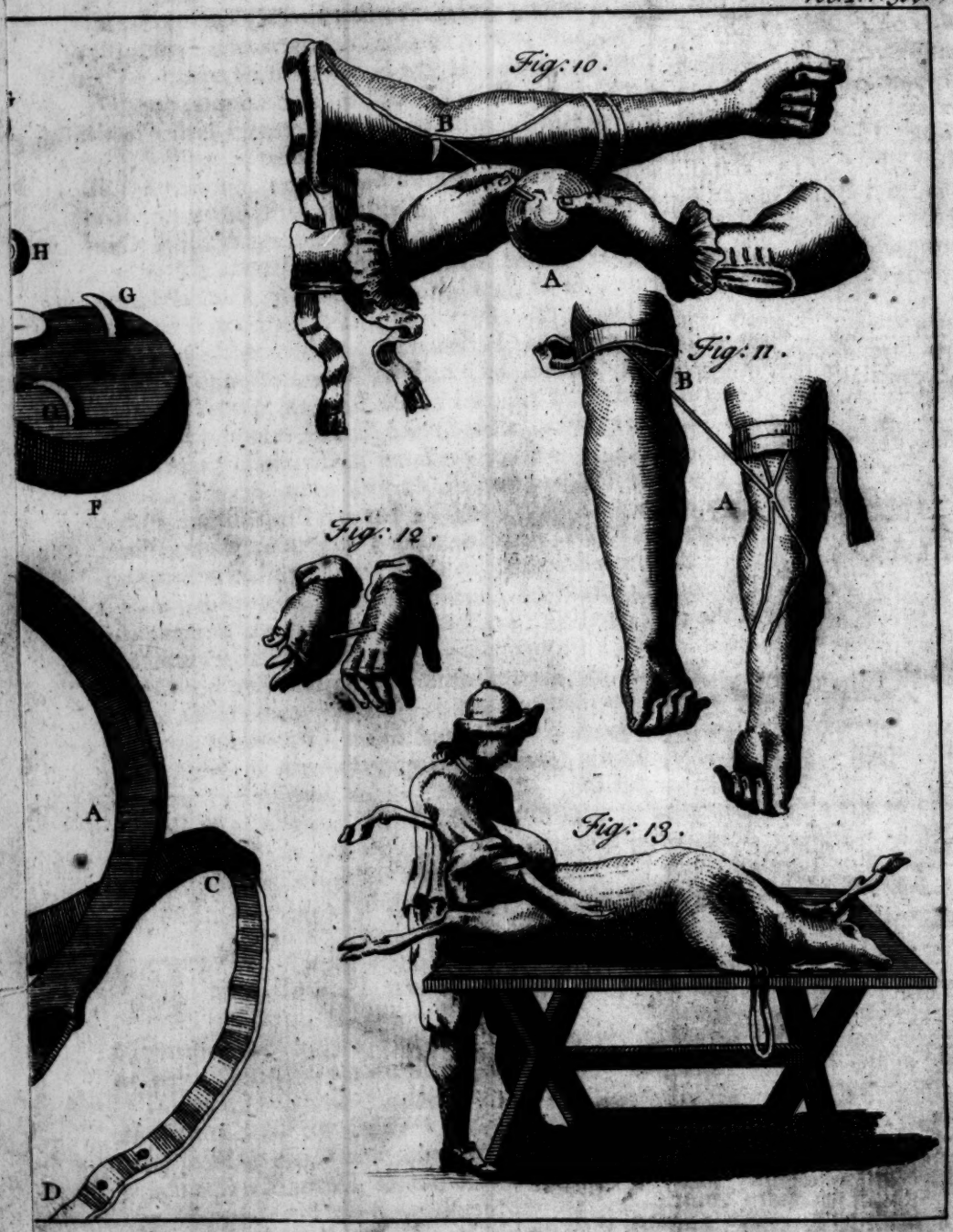
Fig: 10.
B
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H
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Fig: 11.
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Fig: 12.
A
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D
Fig: 13.

Vein is opened in each Arm of the Patient at the same time, that as much of the vitiated Blood may flow out of one Orifice as he receives of the sound by the other. For more on this Subject, among others, the Reader may consult LAMSWARD *in Notis ad* SCULTETUM, and JUNGKEN *Chirurg. Germanica*, pag. 487, where you have Figures of the Operation. If the Blood is to be transfused out of some Animal into the Patient, then a Calf or a Lamb, for Example, are to be secured by Ligatures, and one of their Veins or Arteries opened either in the Neck, Leg, or Thigh; and the rest of the Operation managed as before. See *Tab.* XI. *Fig.* 13, and LAMSWARD *in Append. ad* SCULTETI *Armament. Chirurg.* and BURMANNI *Chirurg. P.* 3. *Cap.* 31. Lastly, where Tubes of Metal or Bone were found painful and less convenient, for want of being flexible, Operators contrived to fasten an intermediate flexible Pipe betwixt the two others, such as Part of the carotid Artery, or of the Ureter from an Ox, Calf, or Lamb, or the Windpipe of a Capon, Duck, *&c.* by which means the Process becomes much facilitated both to the Operator and Patients.

V. The Contrivance of this Artifice, by which the Blood of one Animal is transfused into the Veins of another, is assumed by Dr. LOWER in his Treatise *de Corde*, in opposition to M. DENIS, who, in his *French* Epistle upon this Subject, claims the Invention to himself. It is true, the latter made many Experiments in this way at *Paris*, but with very bad Success. STURMIUS, once a celebrated Professor of the Mathematics at *Altorf*, and VERHIUS, Professor at *Francfurt*, attribute the Invention to MAURIT. HOFFMAN; whereas MUYS asserts, that LIBAVIUS described the Process at large in the Year 1615, but without telling us the Book. The first Injection of Liquors into the Veins of Animals is generally attributed to the celebrated Sir *Christ. Wren*; but I think we have this Artifice described before him, by a Professor of Physic, in a Treatise published *Anno* 1664, in which he explains the Process that had never before been heard of in *Germany*. They who desire more on this Subject may consult MAJORIS, *Lib. de Chirurgiâ infusoriâ*, ETMULLER *Disputat. in eod. Argumento conscript.* ELTSHOLTZ *Clysmatica nova*, PURMANNUS *Chirurgia*, LOWER *de Corde*, SANTINELLUS *in Confusione Transfusionis*, MANFREDUS *de Sanguinis Transfusione*, STURMIUS *in Philosophiâ Eclect. Dissertat.* X. MERCKLINUS *de Ortu & Occasu Transfusionis Sanguinis*, LAMSWARD *in Appendice ad* SCULTETUM, pag. 29. For Injections into the Veins in desperate Diseases, See *Misc. Nat. Cur. Ann.* IX. and X. *pag.* 144. and LOWTHORP *Phil. Transf. Abr.* Vol. III. pag. 226 to 235.

The Invention of this Art.

An EXPLANATION *of the* ELEVENTH PLATE.

Fig. 1. Represents an Arm in which a Vein is to be opened: A denotes the Cephalic Vein, B the Basilic, and C the Median Vein; D the Ligature fixed above the Elbow to make the Veins swell.

Fig. 2. Represents the several Forms of incising a Vein with the Lancet: A shews a longitudinal Incision, B a transverse one, and C, D, oblique ones.

Fig. 3. Exhibits the ancient *German* Phlebotomus or Fleam for opening a Vein, A the sharp Point to be fixed on the Vein, B the Handle to be held in one Hand, while the Part C is struck by a Fillip of the Finger of the other Hand, so as to drive the Point A into the Vein.

Fig. 4. Is a Spring Fleam, now in Uſe with ſome. The Part A being fixed on the Vein, and the Part C being elevated depreſſes the Spring by the End B, which by its Reaction or Elaſticity ſtrikes the End C upon the Fleam A, ſo as to drive it into the Vein. DD is a hollow Caſe of Braſs or Silver, in which the Spring Part of the Inſtrument B is included.

Fig. 5. Repreſents the *French* Phlebotomus, or Lancet, bent ſo as to form an obtuſe Angle, as it ſhould be for the more convenient holding it in Bleeding.

Fig. 6. Is the great Aneuriſm as big as one's Head, obſerved by PURMANNUS in an Arm near the Joint or Bend of it.

Fig. 7. Shews the manner of applying the Ligatures above and below an Aneuriſm, in the Operation for that Diſorder. A B the Artery, C the Aneuriſm, D the Upper Ligature, E the Lower Ligature.

Fig. 8. Exhibits an Inſtrument contrived both for the Prevention and Cure of Aneuriſms. A A A denote the Plate of Iron or Steel adapted in Form to the Flexure of the Arm. B its Fiſſure. C C Ligatures faſtened to the Ends A A, and extended to D D. E denotes a moveable Steel Plate joined by the Hinge I, and covered with a Cuſhion of Cotton or Silk at F, to be fixed upon the Aneuriſm. G G are two ſmall Hooks by which the Inſtrument is faſtened upon the Arm by the Ligatures C C D D. H is a Screw by which the Plate and Cuſhion E F are preſſed down upon the Tumor.

Fig. 9. Repreſents an Inſtrument of the ſame kind with the former, but of a different Shape. Here the Plate and Cuſhion E F are larger, for bigger Aneuriſms than the former. Its Parts and explanatory Letters correſpond to thoſe of the preceding Figure.

Fig. 10. Shews the Apparatus with a Bladder and Tube for Injection of Liquors into the Veins: A the Bladder and Tube, B a Vein of the Arm opened, in which the Tube is inſerted.

Fig. 11 and 12. Exhibit the Transfuſion of the Blood from the Veins of one Man into thoſe of another: B denotes the recipient, and A the emittent Arm.

Fig. 13. Shews the Transfuſion of Blood from the crural Artery or Vein of an Animal into the Arm of a Man, by the Intervention of the Tube A.

CHAP. XV.

Of Inoculation for the Small Pox.

The Deſign of this Chapter.

I. THE Art of engrafting or propagating the Small Pox by Inciſion or Inoculation has been an Operation equally famous in all Nations with thoſe in the preceding Chapter; and therefore we ſhall, for the ſake of Beginners, deſcribe the Proceſs of it, which under proper Circumſtances may be of great Service to Mankind.

Inoculation deſcribed.

II. The Deſign of this Operation is to communicate by Art a milder Species of the Small Pox to the Infant or adult Patient than that received by the natural Infection, and this by engrafting ſome of the variolous Matter; in order to which a ſmall Inciſion [a] is to be firſt made with a Scalpel or Lancet through the

[a] But Dr. HARRIS in his Chirurgical Diſſertations directs only the Cuticle to be abraded, and the variolous Matter to be ſpread on the naked Skin.

Skin

Skin of the Arm, and having inſerted a ſmall Particle of the purulent Matter taken from a mild kind of the Pock, the little Wound is then to be dreſſed with ſome dry Lint, and covered with a Plaſter. After the Operation the Patient muſt conſtantly keep to his Chamber, the Air of which ſhould be moderately warm, and his Diet regulated by ſome prudent Phyſician, by which means the Diſorder will ſhew itſelf in about ſeven or eight Days, without any malignant Symptoms; and, if aſſiſted by a proper Regimen and moderate Warmth, it uſually runs gently through its ſeveral Stages. When the Patient has once had the Diſorder this way, though ever ſo mild, we are aſſured by Experience that they never have it again; and therefore the Opinion of thoſe ſeems to be well grounded who think the Propagation of the Small Pox by Inoculation might be of general Uſe and Benefit to Mankind, in preſerving the Lives of ſome, and the moſt important Members of others, as the Face, Eyes, Hearing, Viſcera, *&c.*

The Operation practiſed by other Nations.

III. Hiſtory informs us that the Diſorder was this way propagated many hundred Years ago among the *Greeks* and *Turks*; whereas it is but of late Years that the *European* Nations have come into it, among which the *Engliſh* ſeem to have approved and followed it moſt. The Experiment ſucceeded ſo well in the Hands of the *Britiſh* Phyſicians, that the late King *George* himſelf countenanced the ſame in all his Dominions; and from thence the Practice prevailed with Succeſs in *Germany*, particularly at *Hanover*, *Onolzbac*, and *Pyrmont*.

The Objectors againſt this Practice.

IV. It muſt however be confeſſed that there were many both among the *French* and *Engliſh* who endeavoured to ſuppreſs and vilify this Practice in their public Libels, condemning it as fatal to Mankind, and unfit to be encouraged among a Chriſtian People; but I think all they have objected or advanced, has been long ago ſufficiently anſwered and obviated by the learned Dr. JURIN, and other able Phyſicians. They who deſire more particular Accounts may conſult the Diſſertations publiſhed by the celebrated Phyſician laſt mentioned, as alſo thoſe by PYLARINUS of *Italy*, the celebrated VATERUS of *Vitemberg*, *Act. Erud. Lipſ. An.* 1723, 1725. *Act. Natur. Curioſ.* Vol. 1. *Obſ.* 75. *pag.* 133, *&c.*

My own Opinion of it.

V. But for my own Part, if I may ſpeak freely, I am ſo far from thinking the Practice fatal or miſchievous, that I rather firmly believe it might, under a proper Management, be of the greateſt Uſe and Benefit to the Lives and Healths of Mankind. For, if I think right, the Small Pox ariſes from a peſtilential *Virus* or Matter lodged in the Blood from the very firſt Day of the Birth, which breaks out almoſt in every Perſon ſooner or later; and the more early, uſually the better: For 'tis very ſeldom we obſerve the Pock favourable in thoſe more advanced in Years; ſo that the Matter ſeems to multiply itſelf in the Blood, and augment with the Patient's Age. And this, in my Opinion, is the Reaſon why we oftener meet with the Small Pox more mild and favourable in Infants than Adults. If therefore the Diſorder be procured of a mild kind by this Operation, and the Blood cleared of its latent *Virus*, while ſmall in Quantity, and the Infant young, I doubt not but many, and eſpecially the Children of Princes and Nobility might be thus not only preſerved from Death, but even conducted ſafely through the ſeveral Stages of the Diſeaſe, without the Inſults of its moſt malignant Symptoms. We are convinced by Experience as well as Reaſon, that the Diſorder which breaks out from a natural Infection is generally more ſevere and fatal than that procured by Art; and no Wonder it ſhould be

ſo, ſince in the laſt the Phyſician has an Opportunity of chuſing the moſt favourable Seaſon, and of preparing his Patient beforehand by a proper Regimen, Diet, and Medicines.

CHAP. XVI.

Of Scarification and Cupping.

The Method of dry Cupping.

I. SCARIFICATION and CUPPING was an Operation frequently performed by the moſt ancient Surgeons and Phyſicians, [a] notwithſtanding the Moderns have by their Pride or Neglect turned the Buſineſs over to thoſe who attend the Baths and Hot-houſes: Yet, as it makes none of the leaſt Operations in Surgery, we ſhall here briefly conſider and explain the ſame. The Operation of Cupping is indeed vague and not confined to any particular Member of the Body; but whenever the Cupping-glaſs is applied, 'tis fixed upon the Skin, either entire or ſcarified; and hence we have a twofold Diſtinction of Cupping into *dry* and *gorey*. The Figure of the Cupping-glaſs for either of theſe Purpoſes is repreſented in *Tab.* XII. *Fig.* 1. In dry Cupping the Glaſs adheres to the Skin by expelling or rarifying its included Air by lighted Flax or the Flame of a burning Candle within it, ſo that the Glaſs is preſſed upon the Part with a conſiderable Force by the external Air; in which Artifice our ordinary Cuppers are ſufficiently well verſed. The Uſe of this dry Cupping is twofold, either to make a *Revulſion* of the Blood from ſome particular Parts affected, or elſe to cauſe a *Derivation* of it into the affected Part upon which the Glaſs is applied. Hence we have a Reaſon why HIPPOCRATES [b] orders a large Cupping-glaſs to be applied under the Breaſts of Women who have a too profuſe Diſcharge of their Menſes, intending thereby to cauſe a Revulſion of the Blood upwards from the *Uterus*. And upon the ſame Principle I have myſelf ſucceſsfully cured a profuſe Hæmorrhage at the Noſe, and an Hæmorrhage or Spitting of Blood from the Lungs, by applying Cupping-glaſſes to the Legs and Feet, particularly about the Ancles and Knees. SCULTETUS gives us a remarkable Inſtance in *Obſ.* 85. of a Woman who by the repeated Application of ſix Cupping-glaſſes (without Scarification) to her Thighs was not only relieved of the troubleſome Symptoms cauſed by an Obſtruction of her Menſes, but was alſo thereby freed from the Obſtruction itſelf. Dry Cupping is alſo uſed with Succeſs, to make a Revulſion by applying the Glaſſes to the Temples behind the Ears, or to the Neck and Shoulders, for the Removal of Pains, Vertigo's, and other Diſorders of the Head; they are alſo applied to the upper and lower Limbs to derive Blood and Spirits into them when they are paralytic; and laſtly, to remove the Sciatica and other Pains of the Joints. The Operation is in theſe Caſes to be repeated upon the Part till it looks very red, and becomes painful.

Cupping with Scarification.

II. But Cupping is much oftener joined with Scarification, than uſed alone, with us in *Germany*, and in other Northern Countries: In which Caſe the Part is firſt to be dry cupped till it ſwells and looks red, and the Skin is to be punctured or inciſed by the Scarificator, *Tab.* XII. *Fig.* 2. with which you may make ſixteen or twenty ſmall Wounds in the Skin, cloſe enough to each other, to be

[a] As we read in HIPPOCRATES, CELSUS, GALEN, &c. [b] Sect. V. Aphor. 50.

covered

covered by the Cupping-glaſs, into which the Blood ought to flow from them. (*See Fig.* 3.) In repeating theſe Inciſions and re-applying the Cupping-glaſs upon freſh Parts of the Skin, the Operator muſt obſerve to begin at the loweſt Part, and thence aſcend gradually, that his Work may not be obſcured by the refluent Blood from above. Having ſcarified the Skin, and applied the Cupping-glaſs with Fire, as before directed, the latter will adhere firmly to the Part, and the Preſſure of the external Air will force a conſiderable Quantity of Blood into it from the Inciſions: But as ſeveral Glaſſes (ſometimes ſix or eight) are often applied at one and the ſame time, and to different Parts of the Body, the Operator muſt manage his Buſineſs ſo that ſome Glaſſes may be filling while he is ſcarifying and adapting the others; and in thus ſhifting them alternately, he muſt pour out their Blood into a Pan or Veſſel, waſh them in warm Water, cleanſe the Skin with a Sponge dipped in the ſame Water, and then apply the Glaſſes as before. When the Blood ceaſes to flow faſt enough, you muſt repeat your Inciſions with the Scarificator cloſe by the former, and re-apply your Cupping-glaſſes till a ſufficient Quantity of Blood is drawn, or till it ſtops of its own accord. Your Operation being finiſhed, and the Skin well cleanſed with a Sponge and warm Water; it is next to be rubbed over with a Bit of Deer's Suet, to promote the Healing. But if the Blood ſtill continues to flow, which it does but ſeldom, you are then to waſh the Skin with *Spir. Vini, Aq. Reg. Hungar.* binding it up with a Compreſs and Bandage.

III. The modern Surgeons have, for Conveniency to themſelves and Eaſe to the Patient, contrived a Scarificator different from the laſt mentioned, which conſiſts of ſixteen ſmall Lancet Blades fixed in a cubical Braſs Box, with a Steel Spring, as at *Fig.* 4. *Tab.* XII. When the Side of this Inſtrument marked CCCC is applied to the Skin, and the included Spring bent by the Lever A, by depreſſing the Button B, it is ſo ſuddenly let looſe as by its Force to ſtrike the Points of the ſixteen Blades out of the Caſe at one Inſtant into the Skin, making as many ſmall Inciſions at once in their regular Order, over which the Cupping-glaſs is to be applied, as we before directed. We meet indeed with the Figure of a Scarificator not much differing from this in PAREY's Surgery, *Book* XI. *Chap.* 5. and after him in LAMSWARD's Notes to the *Armamentarium* of SCULTETUS; but they do not propoſe the Inſtrument for other Uſes than to ſcarify the unſound Parts in an incipient Mortification; whereas this is uſed with good Succeſs by our Cuppers in many other Diſeaſes, as I myſelf have frequently ſeen and experienced; notwithſtanding M. GARENGEOT [a] condemns it as a bad and uſeleſs Inſtrument; but perhaps that Gentleman never ſaw the Uſe and Effects of it. The Modern Scarificator.

IV. Cupping with Scarification is uſed in various Parts of the Body, particularly in the Head, Neck, Shoulders, behind or under the Ears, Occiput, Back, and Loins, Legs and Arms, and near the Ancles, and this for making a Derivation, Revulſion, or Evacuation in the various Diſorders incident to plethoric Habits, ſuch as various inflammatory Diſorders in the Head, Eyes, Ears, Tonſils, and Uvula, particularly violent Head-achs, Ophthalmia's, Amauroſes, and Suffuſions, *&c.* In all which Caſes it is hardly poſſible to expreſs the general Benefit which may be received from this Operation, eſpecially when Uſes of Scarification.

[a] Tract. *de Inſtrument. Chirurg.* Tom. I. Pag. 413.

timely

timely uſed, and judiciouſly repeated at proper Intervals. Nor is Scarification much leſs beneficial than Phlebotomy in thoſe Patients, whoſe Veins are ſo ſmall or obſcurely ſituated, that it would be dangerous opening them by the Lancet; yet as it is often abſolutely neceſſary to make a Diſcharge of Blood ſome way from them, I have often adviſed this Method to be followed, and with good Succeſs. The excellent Anatomiſt MORGAGNI [a] adviſes Scarification upon the Occiput in Apoplexies, and all ſoporous Affections, as one of the beſt Remedies that can be recommended, either from Reaſon or Experience; becauſe in this way the heſitating Blood may be diſcharged from the obſtructed Veins of the Brain, which communicate with thoſe of the Occiput, or at leaſt it may by this means obtain a more free Motion; but then you ought to ſcarify deep, as he obſerves. Scarification and Cupping upon the Occiput is alſo extremely uſeful in an Ophthalmia, or Inflammation of the Eyes; and a like Diſcharge procured by deep Scarification upon the affected Side in a Pleuriſy, after Phlebotomy premiſed, gives great Relief, according to LANCISI. Laſtly, this Method of evacuating by Scarification and Cupping, makes one of thoſe which are generally repeated at ſtated Seaſons of the Year, like Bleeding and Purging Spring and Fall, *&c.* which the Patient, being once accuſtomed to, ought never to neglect them, for fear of incurring their former, or even worſe Diſorders.

Scarification by ſome rejected and deſpiſed.

V. I muſt indeed own that there are many among our Phyſicians and Surgeons who contemn this Operation as of little or no Efficacy, and the Reaſon which they offer is, that hereby only that Blood is diſcharged which lodges itſelf betwixt the Fleſh and Skin; but this Judgment ſeems too haſtily formed, and without a juſt Foundation: For Experience hath taught myſelf and many other eminent Phyſicians, that as much and as thick Blood may be diſcharged by Scarification and Cupping as by Phlebotomy, and conſequently it muſt be little leſs, if not equally beneficial in all thoſe Diſorders which require Bleeding. But this I can boldly affirm from my own Reaſon and Experience, that in ſome Caſes Scarification excells Phlebotomy, inaſmuch as the Cupping-glaſs by firmly adhering to the Skin not only draws out the Blood, but alſo gives it a greater Impetus or Tendency towards the ſcarified Part; and therefore it conſtantly gives certain and ſpeedy Relief in moſt Diſorders of the Head, Eyes and Ears, Apoplexies, ſleepy Diſorders, Inflammations of the Tonſils, Hæmorrhages and Pains of various kinds, *&c.*

Whether Scarification be dangerous.

VI. There are again other Phyſicians who imagine Scarification to be not only uſeleſs, but even pernicious: For, ſay they, we have Inſtances of Patients who have been not only violently diſordered, but even killed, by the Operation being performed at an improper Time, or with an unclean or infected Inſtrument. [b] Thus a Patient may be in Danger of catching ſome foul Diſorder by being ſcarified with an Inſtrument that has not long before been uſed upon one infected with the Leproſy, Pox, Itch, *&c.* for thus the Infection will be inoculated almoſt in the ſame manner as the Small Pox. But if Scarification muſt

[a] *Adverſar. Anatom.* V. *pag.* 83. & VI. *pag.* 108. ZACUTUS LUSITANUS alſo mentions a Patient freed from an Apoplexy by repeated Scarification.

[b] Thus HILDANUS *Cent.* V. *Obſ.* 71. remarks that a Palſy aroſe from hence, though it might proceed from a Multitude of different Cauſes.

be

be condemned and rejected on this account, ſo muſt alſo *Phlebotomy* and many other Operations, in which the ſame Inſtrument is applied that has been uſed before. But that the Patient may have no Uneaſineſs from this Quarter, it may not be improper for him to ſee that his Cupper's Scarificator and Apparatus are very clean; or elſe they may keep a Scarificator of their own, which being kept clean and dry, can give no room to make any frivolous Scruples of this Nature.

The Scarification uſed by Surgeons.

VII. There ſtill remains another ſort of Scarification, uſed by Surgeons in violent Inflammations, incipient or confirmed Mortifications, peſtilential Carbuncles, and the like; in which Caſes it has been found highly ſerviceable to diſcharge the ſtagnant and vitiated Blood, by making many ſmall Wounds or Inciſions in the Skin with a Scalpel or Lancet, though without the aſſiſtance of Cupping-glaſſes. This kind of Scarification is uſually denominated *Chirurgical* by the Cuppers, in Contradiſtinction to theirs, as Surgeons uſe it frequently in Gangrenes and Mortifications, and ſometimes in ſwelled Legs and Dropſies, eſpecially that of the *Scrotum*, and ſometimes for the *Hydrocephalus*. But though it may be ſometimes highly neceſſary to ſcarify the Legs of dropſical Patients, when the Skin is diſtended ſo as almoſt to burſt; yet it ought not to be made indiſcriminately, without abſolute Neceſſity, and a proper Regard to the Patient's Age, Habit, *&c.* otherwiſe it is even probable, that the ſcarified Part will gangrene or mortify, and deſtroy the Patient. PLINY (*Hiſt. Nat. Lib.* LXXVIII. *Cap.* I. *&* XI.) recommends Scarification of the Gums for the Tooth-ach, which, in my Opinion, may not unfrequently be very uſeful.

The *Egyptian* Scarification.

VIII. Related to Scarifications is the Infliction of ſmall Wounds within-ſide the Noſe, Lips, Ears, and Gums, uſed by the *Egyptians*, and recommended by [a] CELSUS and [b] ARETÆUS, for abating Inflammations, and relieving various other Diſorders, in which it very often ſucceeds admirably; at which we need the leſs wonder, if we conſider what Relief Nature herſelf often gives the Patient, by making a plentiful Hæmorrhage at the Noſe, in ardent Fevers, Head-achs, *&c.* add to this, that the *Egyptians* [c] had a Practice of beating or whipping the Calves of the Legs with Rods, till they looked red, and then ſcarifying, or making Inciſions in the Skin; by which means they procured Relief, and made uſeful Revulſions from the Head and Brain in violent inflammatory Diſorders of thoſe Parts, and in Fevers with Delirium, Watchings, *&c.* but notwithſtanding the Uſefulneſs of this Practice, it is at preſent hardly ſo much as known among our *European* Nations.

Scarification of the Eyes.

IX. Many of the ancient Phyſicians and Surgeons, with *Hippocrates*, had a Practice of ſcarifying the Inſides of the Eyelids, and even the Eyes themſelves, with a proper Inſtrument for the Purpoſe, in many of the Diſorders which infeſt that Organ, as is very apparent from the Treatiſe which *Hippocrates* has left, *De Viſu*. This Operation of ſcarifying the Eyes, though neglected from the Time of *Hippocrates*, has yet been renewed, or lately introduced again, by the *Engliſh* Oculiſt *Woolhouſe*, at *Paris*; and it has been alſo

[a] *Lib.* IV. *Cap.* 2. where he directs to draw Blood from the Noſe in violent Head-achs.

[b] *De Chron. Morb. Lib.* II. *Cap.* 11. *de Cephaleâ*, pag. 128.

[c] PROSP. ALPINUS, *Medicina Ægyptior.* p. m. 72. where you have a Figure of this Practice.

per-

performed with tolerable Succeſs by ſome others of the preſent Age, as we have Accounts. But for the Inſtruments, and manner of performing this Operation, we ſhall be more particular in our following Account of the Operations for the Eyes.

CHAP. XVII.

Of Bleeding by Leeches.

Choice of the beſt Leeches.

I. LEECHES, or *Sanguiſugæ*, are a Species of aquatic Worms or Inſects, of the Shape repreſented in *Tab.* XII. *Fig.* 5. which being applied to any Part of the Body, bite through the Skin, and extract Blood from the ſmall Veins, which frequently conduces much to the Health and Recovery of a Patient; for which Reaſon they have been uſed from the moſt early Times by the ancient *Greek* and *Roman* Phyſicians, as may be ſeen in GALEN's profeſſed Diſſertation on this Inſect, commented on by SEBEZIUS. As there are Leeches of different Kinds and Natures, it will firſt be proper to diſtinguiſh and make a due Choice of the beſt, which are always found in clear Brooks or Rivulets; whereas thoſe taken from Lakes, Fiſh-ponds, and ſtagnant Waters, generally have ſomething malignant in their Bite, inſomuch as ſometimes to excite great Pain, Inflammation, and Tumor in the Part, and Uneaſineſs in the whole Body. It is alſo an Obſervation made by ſome of the moſt expert Surgeons, that the beſt Leeches have ſlender and pointed Heads, with greeniſh and yellowiſh Lines or Streaks on their Backs, and their Bellies of a reddiſh yellow; whereas thoſe are the worſt, or moſt malignant, which having a thick and obtuſe Head, incline from a dark blue to a black Colour on the Back and Sides. But you ought to obſerve it as a neceſſary Caution, never to apply Leeches which have been lately catched in Rivers or foul Waters, before they have been kept ſome time in a Glaſs full of clean Water, to be often ſhifted, that they may cleanſe themſelves from what Filth or Venom they may have imbibed; and when they have been thus kept for a few Months, they may be afterwards ſafely uſed, without incurring any bad accident.

Method of applying them.

II. Before the Leech is applied to the Skin, it ſhould be taken out of the Water, to ſtand about an Hour in an empty Cup, or other Veſſel, to drain itſelf, that being thus rendered thirſty and empty, it may both adhere more firmly to the Part, and draw off a larger Quantity of Blood. As for the Part to which they may be applied, that may be on the Temples or behind the Ears, when the Diſorder lies in the Head or Eyes, and eſpecially when the Patient is delirious in a Fever, or over-charged with Blood; but ſometimes they may be commodiouſly enough applied to the Veins of the *Rectum*, in Diſorders proceeding from an Obſtruction of the wonted Evacuation this way, or in the blind and painful Piles; and by way of Revulſion they will be here uſefully applied in profuſe Hæmorrhages of the Noſe, and ſpitting and vomiting of Blood; in which Caſes they are of incredible Service, eſpecially when the Diſorder ariſes from Obſtructions of the hæmorrhoidal Flux. But before you apply the Leech, the Skin of the Part muſt be firſt well rubbed till it becomes

hot and red; which done, you take hold of the Leech by its Tail with a dry Cloth, or you may place it leaning half way over the Edge of a Cup, and ſo apply it that it may creep out upon the Part, which they are no ſooner fixed upon, but they generally bite and draw the Blood very eagerly. When ſeveral Leeches are to be uſed, you muſt apply each of them to the Part in this manner ſucceſſively; and if they ſhould refuſe to bite or adhere to the Skin, as they ſometimes do, you may in that Caſe put a little Blood of a Pigeon, Chicken, *&c.* upon the Skin; and if that will not allure them, you muſt apply freſh Leeches in their ſtead. The Application of Leeches to the *Caruncle* in the greater or inner *Canthus* of the Eye, is found to be extremely uſeful in all inflammatory Diſorders of that Organ, after *Phlebotomy* has been firſt premiſed.

Treatment after their Application.

III. When the Leeches are diſtended with Blood, they generally ſeparate from the Skin, and leave the Part of themſelves; but if it be neceſſary to draw ſtill a larger Quantity of Blood, you muſt either apply freſh Leeches, or elſe cut off the Tails of thoſe which are drawing with a Pair of Sciſſors, by which means the Blood will run through them, and they will draw almoſt as long as you pleaſe. If the Leeches do not ſeparate ſpontaneouſly after a ſufficient Quantity of Blood has been evacuated, upon ſprinkling a little Salt or Aſhes upon the Part, they uſually leave it preſently; which Method ſhould be the rather taken, becauſe forcing or pulling them away often occaſions a Tumor and Inflammation of the Part. The Operation being thus finiſhed, thoſe Leeches which are whole may be returned into the Glaſs again, and reſerved for future Uſes; but thoſe die which have had their Tails cut off. The Wound made by this Inſect may be firſt waſhed with warm Wine or Water, and then dreſſed with ſome vulnerary Plaſter; though there is ſeldom any occaſion for the latter, as it generally heals up faſt enough of itſelf. They who deſire any more upon this Inſect, may conſult *Galen*, *Aldrovandus*, *Geſnerus*, *Botallus*, *Petr. Paul. Magnus*, *Sebizius*, *Heunius*, *Crauſius*, *Schraderus*, *Stablius*, *&c.* who have wrote thereof more at large.

CHAP. XVIII.

Of Acupuncturation uſed by the Chineſe *and* Japoneſe.

SOMEWHAT akin to Scarification is the famous Operation of the *Chineſe* and *Japoneſe*, termed *Acupuncturation*. Thoſe Nations rejecting Scarification and *Phlebotomy* as pernicious, have recourſe to their *Acupuncturation* and *Cauteriſation*, or burning with *Moxa*, as their moſt potent Remedies in almoſt all Diſorders. The firſt of theſe Operations they perform with a large Gold or Silver Needle (*Tab.* XII. *Fig.* 6.) which they ſtrike into the Fleſh, either with their Hand or the little Hammer, *Fig.* 7. It is indeed more than a little ſurpriſing, that ſo deſperate and ſevere an Operation ſhould be ſo much practiſed by a People in other reſpects judicious; and that too, in the Head, Breaſt, Abdomen, Arms, Legs, Thighs, and moſt other Parts of the Body, even in the Abdomen of Women with Child, when the *Fœtus* is reſtleſs: But I do not know

know that the Practice has been received by any of our *European* Nations; and therefore, as the Proceſs is ſo much abhorred, we ſhall not here give a prolix account thereof. They who deſire more, may conſult RHYN *de Arthritide*, pag. 145, 183, 190; and KEMPFER *in Amœnitatibus exoticis*, pag. 582; alſo in his Deſcription of *Japan*, in which Country both theſe Surgeons were Spectators of the Operation.

CHAP. XIX.

Of Iſſues.

The Seat of Iſſues.

I. ISSUES are little Ulcers made deſignedly by the Surgeon in various Parts of the Body, and kept open by the Patient, for the Preſervation or Recovery of his Health. They are by ſome [a] denominated *Cauteria*, but improperly; becauſe by that Term we uſually mean a cauſtic or corroding Medicine. In this Operation the Phyſician endeavours by Art to imitate and relieve Nature, who often forms Ulcers in various Parts of the Body of her own accord, for diſcharging pernicious Humours, whereby People are often freed from grievous Diſorders, and enjoy a healthy State. The Parts in which Iſſues are generally made, are either, (1.) the upper Part of the Head; (2.) the Neck; (3.) the Arms, betwixt the Biceps and Deltoeide Muſcle, near the Inſertion of the laſt; (4.) in the Thighs, eſpecially within-ſide, immediately above the Knee, in a Cavity eaſily felt by the Fingers; and laſtly, (5.) Iſſues are ſometimes made in the Legs, on their interior ſide, in a Cavity immediately below the Knee.

The firſt Method of making Iſſues by Inciſion.

II. Though there are ſeveral Methods of making Iſſues, yet none ſeem to be more ready than the following; *viz.* firſt to mark the proper Place with Ink, and then elevating the Integuments betwixt the Thumb and fore Finger of the Surgeon and an Aſſiſtant on each Side, you next proceed to make an Inciſion through them, either with the *Scalpel* or Lancet, big enough to admit a Pea; which being inſerted and covered with a Plaſter and Compreſs, nothing more is wanting than your Roller to compleat the Operation. Thus by cleanſing and dreſſing the Wound every Morning and Evening with a freſh Pea, it by degrees, in a day or two, degenerates into a little Ulcer, diſcharging daily a Quantity of purulent Matter, which ſhould be carefully cleanſed or wiped off at every Dreſſing.

A ſecond Method by the actual Cautery.

III. There is a ſecond Method of making Iſſues by wounding the Skin with a red-hot Iron, or actual Cautery, which is uſually included in a ſort of Capſula, or Caſe of Iron, *Tab.* XII. *Fig.* 8. A, to conceal it from terrifying the Patient. When the Caſe B B is fixed upon the proper Part for the Iſſue, the Cautery, or red-hot Iron C, is then preſſed down upon the Integuments, and the Eſchar, or Burn, is next to be dreſſed with freſh Butter, or *Ung. Baſilic.* till it at length ſeparates in repeating the Dreſſing every Day; and then the

[a] CAPIVACCIUS has a Diſſertation *De Rectâ Cauteriorum Adminiſtratione*, in which he treats only of Iſſues, which the *French* alſo term *Cautere*.

little

little Ulcer formed is to be filled with a Pea, and dreſſed as before. Though this Method of making Iſſues according to the Ancients is more ſevere, yet it muſt be equally more efficacious than the other, as the Pain and Cauteriſation muſt neceſſarily make a conſiderable Revulſion; though there are but very few Patients who will ſubmit to it.

A third Method by Cauſtics.

IV. The third and laſt Method of making Iſſues, is by the Application of potential Cauteries, or corroding Medicines; in order to which a piece of Plaſter is firſt perforated, as in *Tab.* XI. *Fig.* 11. and then applied, ſo as its Aperture may cover the Place marked with Ink for the Iſſue: A Piece of the Cauſtic, mentioned *Part* I. *Book* IV. *Chap.* III. *Sect.* 11. is then impoſed upon the Aperture of the Plaſter, and retained cloſe down upon the Skin with ſome ſcraped Lint, a ſmall Compreſs, and a large Plaſter; and laſtly, with a larger Compreſs and Bandage. The Operation thus far advanced, the Patient is now to be ordered to reſt for about ſix or eight Hours, more or leſs, according as the Cauſtic may be in Strength; which Time being elapſed, and the Dreſſings removed, the Eſchar is to be treated as we before directed at *Sect.* III.

V. But in whichever of theſe Methods you make the Iſſue, it muſt be dreſſed at leaſt twice every Day, eſpecially if it runs well, and in the Summer-time; and at each Dreſſing you muſt put in a freſh Pea, and cover it with a clean Plaſter, or piece of waxed Paper or Silk, or an Ivy Leaf retained with Compreſs and Bandage. But the Deligation for Iſſues is much more commodiouſly performed with a leathern Swath, faſtened by Claſps, as in *Tab.* XII. *Fig.* 9. than by a circular Linen Roller. It is remarkable that ſome uſe Peas of Silver or Wood to dreſs their Iſſues with, inſtead of the common ones; but the Difference in their Effects is not material. In this manner Iſſues are to be kept open, till the Patient is recovered of the Diſorder for which they were made; and in ſome Caſes they ſhould be continued as long as the Patient lives; or if the ſame Diſorder, or ſome other, returns upon drying them up, they muſt be again opened immediately.

Uſe of Iſſue.

VI. Iſſues are uſed chiefly for various Diſorders in the Head, Eyes, Ears, Teeth, the Sciatica, and other painful Diſorders, which are this way frequently relieved or cured. The Uſe and Advantage of Iſſues is well known, and daily experienced by moſt Surgeons, contrary to the Opinion of HELMONT, and ſome others, who think they ſerve only to torment and trouble a Patient; however, I muſt frankly own, that a Cure is not to be expected from Iſſues; and though they generally give ſome ſmall Relief, yet in many Caſes I have found it too inconſiderable to be ſenſible; but if, upon Trial, they afford no great Benefit, it is beſt to dry them up again in a little time. But we muſt not forget to take notice, that it is frequently neceſſary to make two or more Iſſues, to produce any conſiderable Effect in ſtubborn Diſorders, as one in each Arm, or in one Arm and Leg of the ſame Side, *&c.*

Method of drying up Iſſues.

VII. In order to cloſe up an Iſſue, when that ſhall be judged proper or neceſſary for various Reaſons, little more is required than to diſcharge the Pea, and refrain from putting in any more, by which means alone it will cloſe up in a ſhort time; but if any proud Fleſh ſhould protrude itſelf, it may be amputated, or elſe removed and taken down with *Alum. uſt.* Laſtly, it is obſervable, that when Iſſues of People far advanced in Years ceaſe to make

their wonted Diſcharge, and turn of a livid and blackiſh Hue, it is a Sign they are invaded by ſome deſperate Diſorder, and that even Life itſelf is very near its Period.

CHAP. XX.

Of Bliſtering with Cantharides.

Bliſtering deſcribed.

I. BY Bliſtering is underſtood an Elevation of the Cuticle from the Cutis into Veſicles, or Bladders replete with a ſerous Humour, by the Application of external Remedies, and chiefly *Cantharides* to the Skin; which may be applied either in form of a Paſte mixed up with Yeaſt, or elſe mixed with ſome Emplaſter, and then ſpread on Linen or Leather, which is the modern Practice; and therefore we conſtantly meet with the *Emp. Veſicator.* ready prepared in the Shops of the Apothecaries. Theſe being applied and retained upon the Part with Bandage and Compreſs, in about eight, ten, or twelve Hours time, will raiſe the Cuticle under the Plaſter in a Bliſter, replete with a thin and acrimonious Lymph. The before-mentioned Number of Hours being expired, the Bliſter-Plaſter is removed, and the Cuticle, if yet entire, is opened with a Pair of Sciſſors, its Contents being gently abſorbed by Lint or ſoft Linen. This done, the Part bliſtered is dreſſed with ſome ſoft and cooling Plaſter; which Dreſſing is repeated every Morning and Evening, till the Diſcharge ceaſes, and the Part heals. And though it is remarkable, that the Cuticle is ſeparated from the true Skin by this Plaſter, in the ſame manner as it is in Burns; yet it meets with ſo ſudden a Re-production, as is not a little ſurpriſing. Some make their Dreſſings with Beet or Dock-leaves, ſpread with freſh Butter, inſtead of a Plaſter.

The Size of Bliſter-Plaſters.

II. The Size of Bliſter-Plaſters varies greatly with the Nature of the Patient's Diſorder, and the Size or Figure of the Parts to which they are to be applied; thoſe for the Temples and behind the Ears, may be about the Size of a Crown Piece; as may alſo thoſe for the Neck and Arms, Legs and Thighs, and the Top of the Head; but thoſe for the Back, and between the *Scapulæ*, may advance to two Hands Breadth.

The Uſe of Bliſter-Plaſters.

III. Veſicatories are frequently of very great Benefit, as well as Iſſues, in many of the moſt obſtinate Diſorders; eſpecially when vicious Humours are to be diſcharged from the Blood, or a ſtrong Revulſion to be made from any Part. Thus Veſicatories are of excellent Service behind the Ears, upon the Head, Neck, Arms, *&c.* in all Inflammations of the Eyes, and Suffuſions or incipient Cataracts; as they likewiſe are in all lethargic and paralytic Affections: In which Caſes they give a *Stimulus* to the Blood and Spirits, and excite thoſe Fluids from a languid to a briſk Motion. Strong Veſicatories are alſo frequently uſed in ardent Fevers attended with a *Delirium*; in which Diſorders they are properly applied to the lower Extremities, in order to diminiſh the Influx of Blood ſent to the Head and Brain. Laſtly, Bliſters are uſed with great Succeſs in the Small-Pox, when the Puſtules ſeem to ſtrike in; as alſo in the more obſtinate arthritic and rheumatic Complaints, where they are beſt applied even

even to the Part in pain, according to the Obſervation of SCULTETUS (*Obſ.* 73.) Bliſters are alſo of great Efficacy when applied to the Legs and Thighs in Aſthma's; and a little below the Elbow for the Tooth-ach.

IV. When the Diſeaſe requires a conſiderable Diſcharge this way, it may be convenient to mix a little Powder of *Cantharides* with the Ointment or Plaſter, with which the Bliſter is to be conſtantly dreſſed: By which means greater Benefit may be obtained than one would imagine, in many of the moſt obſtinate Diſeaſes. How to encreaſe the Force of Bliſters.

V. But this Application is ſometimes attended with an *Ardor Urinæ*, or great Heat and Pain in making water; eſpecially if the Bliſters are ſeveral in number, and ſtronger or continued longer on the Parts than uſual; in which Caſe the Patient ſuffers the ſame Symptoms as if he had taken *Cantharides* internally. But then theſe troubleſome Symptoms are as quickly removed by a frequent and plentiful drinking warm Milk, and amygdalate Emulſions. Laſtly, Bliſters ſhould not haſtily, but with great Caution, be uſed for Patients who are hydropic or cachectic; becauſe they frequently produce an incipient or confirmed Mortification. Bliſters often accompanied with *Ardor Urinæ*.

CHAP. XXI.

Of Injections.

I. MANY Diſorders are very difficultly, if at all, curable, unleſs the Parts affected are injected with ſome proper Liquor, by means of a Syringe and a proper Tube; which Operation is by Surgeons called *Injection*, and conſiſts chiefly in drawing the Liquor into the Syringe, and forcing it out again into the diſordered Parts. The Method of performing which is too obvious for any body to be ignorant of. But this Obſervation may be neceſſary, To apply the Syringe and Tube to the Parts very carefully, eſpecially in very ſenſible or nervous Parts, to avoid giving the Patient too much Pain; alſo to be mindful, that the Liquor you inject be not too hot or cold. But what kinds of Liquors and Methods are to be uſed for Abſceſſes and fiſtulous Ulcers, we have before obſerved (in the Book on *Ulcers*, *Chap.* 2. *N.* 3.) Of Injections in general.

II. In Ulcerations and Inflammations of the Tonſils, Uvula, and Fauces, Injections are generally uſeful; but Care is to be taken to preſs down the Tongue with a *Spatula* (*Tab.* I. *litt.* P) or the flat end of a Spoon; and having introduced the Syringe two or three Fingers Breadth into the Mouth, the Injection is to be gently thrown in, ſeveral times. A proper Syringe for this purpoſe is deſcribed by DEKKERUS *Exercit. Pract. pag.* 242.) furniſhed with a crooked Tube, whoſe Extremity is perforated with ſeveral ſmall Holes, as in *Tab.* VI. *Fig.* 11. This Inſtrument is particularly uſeful, when the Patient's Mouth cannot be eaſily opened by a *Spatula*, which is often the Caſe. In Diſorders of the Mouth and Fauces.

III. Injections are alſo frequently thrown into the *Urethra* of the *Penis*, in Men under a Gonorrhœa, in order to waſh out the corrupt Matter, and mitigate the Heat, Acrimony, and Pain. The beſt Syringe for this Purpoſe is that in *Tab.* VI. *Fig.* 10. fitted with a convenient Tube to enter the *Penis*: Alſo the Syringe in *Tab.* XII. *Fig.* 10. may be very commodiouſly uſed in this Caſe; In Gonorrhœa's.

Caſe; becauſe the Liquor does not eaſily fly out of it behind. The moſt convenient Liquors for abating the Heat and Pain in this Diſordet, are warm Milk and Barley-Water, ſweetened with Sugar, Honey, or Syrup of Marſhmallows; and after the Uſe of theſe, when we would heal up and ſtrengthen, or gently aſtringe the Parts, we may uſe the following Mixture with Succeſs.

℞ *Aqua Plantag.* ℥jv. *Mell. Roſat.* ℥j. *Sacch. Saturni* ℈j. *M. F. Injectio.*

If a ſmall Stone ſhould happen to ſtick in the *Urethra*, its Exit may be very much promoted by injecting Oil of ſweet Almonds or Olives by the *Penis*.

In Diſorders of the *Uterus.* For Diſorders in the *Uterus*, to expel the After-Burthen, when it adheres too ſtrictly to the Womb, or to cure Ulcers in that Part, or cleanſe the *Fluor albus*, it is convenient to inject ſome deterging and healing Liquor, by the Syringe which MAURICEAU has deſcribed for that Purpoſe. See *Tab.* VI. *Fig.* 12 and 13. But when this Syringe is uſed, the Surgeon ſhould be careful that its foremoſt high Tube be cautiouſly introduced into the *Vagina*. To anſwer this End in a ſtubborn *Fluor albus*, I have experienced the Syringe at *Tab.* XII. *Fig.* 10. to be very convenient.

In Diſorders of the *Thorax* and *Abdomen.* IV. Laſtly, for the manner in which Liquors are to be injected into the *Thorax* or *Abdomen*, to cure Ulcers or Wounds in thoſe Parts, that has been before deſcribed, when we treated of Wounds; and for thoſe Liquors which are injected by the *Anus* under the Title of Clyſters, we ſhall conſider them when we come to treat of the Operations proper to that Part.

CHAP. XXII.

Of actual Cauteries.

The ſeveral Sorts of Cauteries. I. CAUTERIES are by Phyſicians and Surgeons diſtinguiſhed into two Claſſes, actual and potential: By actual Cauteries they intend red-hot Inſtruments, uſually of Iron, which are applied to many Parts and Diſorders. By *potential Cauteries* we underſtand certain kinds of corroding Medicines, of which we ſhall ſpeak hereafter in *Chap.* XXIV. Of *actual Cauteries*, or hot Irons, it is neceſſary for the Surgeon to have a conſiderable *Apparatus*; inaſmuch as different Diſorders require Cauteries of various Sizes and Figures. Notwithſtanding there are a great Number of cauteriſing Inſtruments deſcribed and figured by the Writers in Surgery, the chief of which we have given you in *Tab.* III. yet it may be neceſſary for the ſkilful Surgeon to invent others, ſuitable to the particular new Diſorders which may ſometimes occur to him.

The Uſe of Cauteries. II. Cauteries have various and manifold Uſes; for they are not only uſed to deſtroy the dead Parts of *carious* Bones, in Cancers, to remove *Scirrhi*, Excreſcences, Carbuncles, and mortified Parts; but they are alſo uſed to make Iſſues and Setons, to ſtop Hæmorrhages in Wounds and Amputations; and laſtly, to remove an Amauroſis, Epilepſy, Sciatica, with Pains in the Teeth and other Parts. We are therefore ſo far from condemning the Uſe of Cauteries, as have SEPTATIUS, HELMONT, BONTEKOE, OVERKAMPIO, CRAAN, *&c.* that we rather recommend them as eminently ſerviceable in many of the before-mentioned Diſorders. They who are deſirous of ſeeing more upon this

this Subject, may read SEVERINUS concerning the wonderful Effects of cauterising, in his elegant Book *De efficaci Medicinâ*, &c.

III. For the right Application of Cauteries, various Obſervations are neceſſary. In the firſt place, the Surgeon ſhould ſee that the Size and Figure of the Cautery correſpond to that of the diſordered Part; and while the Patient is preparing for the Operation, to let the Cautery be heating in the Fire; after which, it will be neceſſary to ſecure the ſound Parts from the Cautery, to prevent giving more than neceſſary Pain. For this Reaſon it is, that the fleſhy Parts upon a *carious* Bone are firſt drawn and held aſide by the Fingers of an Aſſiſtant, before the Cautery is applied. When the Inſtrument is ſufficiently hot, it is to be applied and ſtrongly compreſſed upon the diſordered Part, till the Surgeon perceives the Bottom of the diſordered Parts appear ſound. To effect this the more ſpeedily, it will be neceſſary to have ſeveral Cauteries in readineſs, that, if one be inſufficient, he may uſe a ſecond or a third; which Caution is more eſpecially of Conſequence to be obſerved in *carious* Bones and large Hæmorrhages. The Application of Cauteries.

IV. It may be here not amiſs to take notice, that ſeveral Phyſicians have found by Experience, that Cauteries have ſucceeded in Apoplexies, when all other Remedies have failed. But for the Part to which the Cautery is to be applied, there are various Opinions: SCULTETUS, in *Obſ.* XXXIV. is for having it to be applied to the *Occiput*; but ZACUTUS LUSITANUS, and RIVERIUS, think it much better to cauteriſe between the firſt and ſecond *Vertebra* of the Neck; others again pitch upon the meeting of the coronal and ſagittal Suture, and others prefer different Parts. MISTICHELLIUS, an *Italian* Writer upon the Apoplexy, aſſerts, that no Place can be ſo well pitched upon for Cauteriſations in Apoplexies, as the Soles of the Feet. But the manner in which the Soles of the Feet are to be cauteriſed in that Diſorder, the fore-mentioned Author has endeavoured to demonſtrate in a particular Table, for which ſee *Tab.* XII. *Fig.* II. where the Parts to be cauteriſed are ſignified by the Letters A A, the Cautery by the Letter B; though that Inſtrument may doubtleſs be of another Figure than a ſquare one. I tried this Practice upon a Perſon in an Apoplexy; but, inſtead of recovering, he died. The Uſe of Cauteries in Apoplexies.

CHAP. XXIII.

Of Burning with Moxa.

TO Cauteriſations it may not be improper to join burning with Flax and *Moxa*, which latter is a kind of downy Subſtance, ſeparated from the Leaves of a ſort of *Indian* Mugwort, and is uſed by the *Indian* Nations; but the firſt we find was uſed by HIPPOCRATES, and the other ancient Phyſicians, to cauteriſe Parts in Pain. Some of the Moderns wonderfully extolled Cauteriſation with *Moxa*, as the moſt effectual Means to cure, and wholly extirpate the Gout. But for the Art of cauteriſing with it, it may be neceſſary to obſerve the following Particulars, (*viz.*) In the firſt place to make a ſmall Cone of the Lint or *Moxa*, about a Thumb's Breadth long, (ſee *Tab.* XII. A B, at the Letter A and B) made much after the ſame manner as they

they uſually are for a Suffitus. The Baſis of this Cone is to be ſtuck upon the Part with Gum Arabic, or Gum Tragacanth, and its Point is then to be fired by a Candle, or a burning Coal. By this means not only the Cone will be gradually conſumed, but the painful Part will be at laſt by degrees cauteriſed, and thence the Pains of the Gout will frequently have ſome Remiſſion. But if the Pains do not entirely vaniſh at the firſt, a new Cone is to be applied again to the Part, and the Cauteriſation thus continued till the Pain ceaſes. But, however this Proceſs may have been cried up by many of the *Europeans*, it is at preſent quite in Diſuſe, and that not without Reaſon; for, beſides the acute Pain which it cauſes, it is frequently found to have little or no Effect. But the *Chineſe* and *Japoneſe* have the Operation at this time in the higheſt Eſteem; inſomuch that it, with their *Acupuncturation*, makes their chief Remedies.

Theſe Cauteriſations are ſaid to be at preſent in uſe among the *Arabians*. More may be ſeen upon this Head in RHYNIUS *de Arthritide*, pag. 145. CLEYERUS *in Medicinâ Sinicâ*. PURMANNUS *in Chirurg.* Part III. p. 292. PECHLINUS *in Obſ.* pag. 263. VALENTINI *Polychreſt. Exotic.* pag. 197. and a particular Diſſertation upon *Moxa*; and laſtly, KÆMPFER *in Amœnit. Exotic.* pag. 589. and in his *Hiſtor. Nat. Japon.*

CHAP. XXIV.

Of Cauſtic and Corroding Medicines.

The Uſe of *Cauſtics.*

I. CAUSTIC and Corroding Medicines, as they are called by our Surgeons, are thoſe Medicines which being applied to Parts, conſume, and, as it were, burn them like hot Irons; whence the *Greeks* gave them the Names of *Cauſtics*; and CELSUS denominates them *Adurentia* and *Exedentia:* However, they differ in this from actual Cauteries, that they perform their Effects ſlower, and with leſs Force and Pain; whereas in the Application actual Cauteries act inſtantaneouſly, and occaſion moſt acute Pain. Potential Cauteries differ among themſelves in various Degrees of Strength, according to their different Subſtance and Preparation; ſo that ſometimes more, ſometimes leſs, is applied to a Part for any Purpoſe. But among the various kinds of potential Cauteries, the moſt conſiderable and effectual among us is the *Lapis Infernalis*, which is prepared *e Calc. viv. & Cinerib. clavellatis*, and which is applied for the opening Abſceſſes, as we have before mentioned (*in Part* I. *Book* IV. *Chap.* III. N° XI.) but there are ſome who prefer *Lunar* Cauſtic, or a Salt prepared from a Calcination of Soap-boilers Lees, or *Ol. Vitriol.* or a Solution of Mercury in *Aq. fort.* Butter of Antimony, and a Mixture of Soap and Quick-Lime, or laſtly an arſenical or mercurial Sublimate, mixt with a little Honey. But it ſeems much ſafer to abſtain from the arſenical and mercurial Sublimate, leſt we ſhould occaſion thoſe grievous Diſorders and violent Pains, nay even Convulſions and Death, which they ſometimes produce. In what manner potential Cauteries are to be applied for opening Abſceſſes, and making Iſſues, we have before declared in *Part* I. *Book* IV. *Chap.* III. N° 10; alſo *Part* II. *Sect.* I. *Chap.* XIX. N° 4: For thoſe Cauteries are ſaid to be ſtrong enough to remove Warts, Tubercles, Excreſcences,

Excreſcences, Sarcoma's, Encyſted Tumors, Wens, and ſcirrhous Tumors, if they are properly applied either ſuperficially, or to the Root of the diſordered Parts: By theſe an Hydrocele may be conveniently opened, and even a whole cancerous Breaſt may be removed. A conſiderable Inſtance of the Succeſs of this Practice in *Germany*, we have from the celebrated SUTORIUS of *Norimberg*, afterwards Surgeon to the Duke of *Brunſwick*; but great Caution is neceſſary in this kind of Practice, not to irritate ſuch Parts and Diſorders by theſe Medicines, which, if they ſhould prove inflexible, might endanger the Patient's Life: For thus a *Scirrhus* may often be turned into a Cancer; and if they are applied to the Eyes or Eyelids, they may hurt Viſion, and may ſometimes occaſion profuſe Hæmorrhages, if applied near large Veins and Arteries; or, laſtly, they may occaſion Convulſions by injuring the Nerves; though perhaps theſe are not all the bad Conſequences that may attend an injudicious Uſe of potential Cauteries; but for the ſkilful Application of them, we ſhall give ſome Directions hereafter.

CHAP. XXV.

Of Opening Abſceſſes.

THE Methods to be uſed for opening Abſceſſes, I think, have been already deſcribed in Part I. Book IV. Chap. VIII. N° VIII. therefore, to avoid Tautology, we ſhall refer our Reader thither.

CHAP. XXVI.

Of Warts.

I. WARTS are commonly known to be ſmall Excreſcences of the Skin, ſeated in moſt Parts of the Body, but chiefly in the Hands and Face; their Size and Figure are very various, ſome are very broad and flat, ſome again are very ſlender, and others appear in form of a Pear hanging by its Stalk. Theſe are commonly removed more for the Deformity they occaſion, eſpecially in the Face, Neck, and Breaſts of beautiful Women, than for any Pain or Danger: And, notwithſtanding the great Variety of ſuperſtitious and inſignificant Remedies which are ſometimes uſed by the Populace, and even ſome Phyſicians, for the Removal of Warts, none of them are ſo expeditious and certain as the means which come from the Surgeon. The various kinds of Warts.

II. To come therefore to the Purpoſe, we ſhall briefly deliver the chief Artifices uſed by Surgeons for the Removal of theſe Excreſcences; and the firſt that offers is that by Ligature, which conſiſts chiefly in this, violently to bind a Horſe-hair, or a Piece of fine Thread or Silk about the ſlender and depending Root of the Excreſcence. By this means the nutritious Veſſels being compreſſed, and the uſual Supply of Fluids being cut off, it gradually withers and decays. Cure by Ligature.

Cure by Extirpation.

III. A ſecond method of removing theſe Excreſcences is by ſome ſharp Inſtrument, to wit, by taking them up by a Pair of Plyers, and cutting them cautiouſly off with a Pair of Sciſſors. The Wound is to be dreſſed for ſome time with *Lap. Infernalis*, or ſome other cauſtic Medicine, that if there be any of its Root remaining, out of which a freſh Tubercle might ariſe, it may be corroded and deſtroyed.

Removal by Cauſtic.

IV. But if the Excreſcence is of the larger kind, it is more adviſeable to have recourſe to cauſtic Applications. But to make theſe act the more expeditiouſly, it may be proper to cut off the external and the hardeſt Part of the Tubercle, either with a *Scalpel*, Razor, or Pair of ſharp Sciſſors, and then to dreſs the Wound with Oil of Tartar *per deliquium*, or Spirit of Salt. But if theſe ſeem not ſtrong enough for the Purpoſe, more vehement ones may be uſed, ſuch as Spirit and Oil of Vitriol, *Aqua fortis*, and Butter of Antimony. On the contrary, the ſofter and ſmaller kind of Warts may be removed barely by wetting with the Juice of Celandine, or the Milk of Spurge. In the mean time, care ſhould be taken to prevent any of theſe Applications from getting into the Eyes, when they are uſed about the Eyelids, which might blind the Patient. To prevent theſe Effects, it may be proper to circumſcribe the Wart with a Ring of Wax, or a perforated Piece of Plaſter, ſo that the Wart may come through; by which means the Wart only will be corroded, and the other Parts remain entire. By the ſame methods other Tubercles and Spots, which deform a Perſon, may be removed.

Removal by actual Cautery.

V. A fourth method of removing Warts, is by ſome actual Cautery, accommodated to the Size of the Excreſcence, ſo that it may penetrate to its Root, when applied. Though there are many violent means to extirpate Warts, yet none can equal that of the actual Cautery, which occaſions moſt acute, though uſually but a momentaneous Pain. The Part cauterized may be often dreſſed with *Baſilicon*, or ſome other digeſtive Ointment and cooling Plaſter, ſuch as *de Sperm. Ranar.* This is the moſt certain method of removing theſe Excreſcences, for they never return.

Removal by Evulſion.

VI. The fifth and laſt method is that uſed by Mountebanks upon the Stage, which conſiſts chiefly in anointing the Tubercle with ſome mollifying Ointment; after which they very violently pull it out by the Nails of their fore Finger and Thumb. But as this method of Cure is not very agreeable, ſo it is often found to be alſo ineffectual; for they generally return again from the Remainder of the Root.

Cancerous Warts.

VII. Laſtly, we are here not to omit taking notice of ſome Warts which are livid and blue, which are uſually ſeated in the Face, Lips, and about the Eyes, and are of a cancerous Diſpoſition, much better left to themſelves; for when they are irritated, they frequently degenerate into a Cancer, and miſerably torment the Face, Eyes, and other Parts in which they are ſeated.

CHAP.

CHAP. XXVII.

The Method of removing Excreſcences, fleſhy Tumors, and Marks from the Mother.

I. EVERY preternatural Tumor, which ariſes upon the Skin, and grows in the Form of a Wart or Tubercle, is called an Excreſcence; they are by the *Greeks* called *Acrothymia*, and if they are born with a Perſon, as they frequently are, they are commonly called *Naevi Materni*, or Marks from the Mother; but if the Tumor is large, ſo as to depend from the Skin like a fleſhy Maſs, it is then uſually called a *Sarcoma*. Theſe Tumors ariſe in all Parts of the Body; more particularly in the Head, Face, Eyebrows, Neck, Breaſt, Abdomen, Anus, Legs, and Arms. But the worſt of theſe Tumors are thoſe, which ariſe in the private Parts: The Size and Figure of them are various, they ſometimes ariſing to a very conſiderable Bulk, which are deſcribed and figured variouſly by the Writers of Obſervations. With regard to their Colour, ſome reſemble that of the Skin, others are inclined to black or red. And, laſtly, with regard to their Figure, ſome are like Strawberries, Mulberries, Grapes, Figs, Pears, Mice, and various other Figures. What an Excreſcence is.

II. With regard to the Treatment of theſe, it is to be obſerved, that almoſt the ſame Artifices may here take place as for the Removal of Warts either by Ligature, the Knife, or actual and potential Cauteries, according as their different Sizes, Situations, Figures, the Patient's Habit of Body, his Will, and other Circumſtances may require. For the reſt, when any of theſe Excreſcences have a very large Root which the *Greeks* call *Myrmexia*, or if there are large Arteries or Veins near its Root, or if it be firmly joined to any Bone, or have a Tendency to turn cancerous, the Surgeon ſhould then remove them with great Caution, or when there is great Danger he ought wholly to neglect them, to prevent expoſing his Reputation and the Patient to greater Dangers. When theſe Tumors are ſeated near large Veins and Arteries it is often proper to have Styptics, Bandages, and often actual Cauteries in readineſs to ſtop the Hæmorrhage, eſpecially if they are removed by Abſciſſion. Their Removal.

CHAP. XXVIII.

Of Encyſted Tumors, and eſpecially Scirrhi, Atheromata, Steatomata, Meliceres, *and others.*

I. WHEN Tumors that ariſe from different Parts of the Body are contained in certain membranous Coats they are commonly called *Encyſted Tumors*, being ſometimes harder or ſometimes ſofter, of a paliſh Colour, and uſually attended with little or no Pain. Theſe kinds of Tumors ariſe almoſt in all Parts of the Body from Obſtructions, either in the Glands, or adipoſe Membrane, more eſpecially in the Head, Face, and Neck, where they frequently occaſion great Deformity: The membranous Coat with which they are inveſted, is often of a conſiderable Thickneſs, and is uſually the Coat of the diſordered Gland, Various kinds of encyſted Tumors.

or ſome of the adipoſe Cells. At their beginning they are uſually very ſmall and moveable, being a conſiderable Time increaſing by degrees, till at laſt they ſometimes arrive to an enormous and ſurpriſing Bulk. The Conſiſtence of ſome of theſe Tumors is ſoft and fluctuating, of others more hard and conſiſtent: The Figure of them is various, ſome being like Filberds, Acorns, Bullets, Walnuts, and Eggs; others again like Pears ſuſpended by a ſort of Stalk, like ſome of the fleſhy Excreſcences; ſome have a very large Root, and reſemble one's Fiſt, Head, or other Figure. The Bulk of ſome of theſe Tumors has ſometimes encreaſed to that degree as to weigh many Pounds; others of theſe Tumors ſo firmly adhere to the adjacent Parts as to be wholly immoveable, and become of ſo hard a Conſiſtence as to reſemble a bony Callus; though many of them always remain ſoft and moveable. Several kinds of theſe Encyſted Tumors are variouſly diſtinguiſhed by their different Conſiſtences: When their Contents reſemble Paſte they are then called *Atheromata*; if they are of the Conſiſtence of Honey they are termed *Meliceres*; but if they are of a fattiſh Conſiſtency, like Suet or Lard, they then take the Name of *Steatomata*; if they happen in a Gland which becomes indurated, the Tumor is then called *Scirrhous*; and laſtly, when they are of a fleſhy Conſiſtence they are termed *Sarcomata*. Some of theſe Tumors, as [a] Celsus has obſerved, have been found full of Hair. Again, theſe Tumors are variouſly diſtinguiſhed and denominated from their different Situations: For when they are ſeated under the Scalp, they are called by the Name of *Talpa*, *Teſtudo*, or *Lupia*, when they are ſeated in the Neck, *Strumæ*, or *Scrophulæ*; but when they are ſituated in the Hands or Feet, eſpecially near the Tendons of their Muſcles, they are uſually denominated *Ganglia*.

Diagnoſis of encyſted Tumors.

II. Theſe Encyſted Tumors are uſually diſcoverable without much Difficulty by the Eye and Hand; but they are very difficultly diſcernible from other Tumors barely by their external Signs, if we do not diſcover their Difference by feeling whether they are harder, ſofter, or more or leſs conſiſtent; for as the external Skin receives little or no Alteration in its Colour in the ſeveral ſorts of theſe Tumors, we can therefore form little or no Judgment by it. Nor is it of any great Conſequence to be acquainted with the Nature of the included Matter, except the Hardneſs, before we proceed to the Cure of theſe Tumors; for whatever Matter they contain, the manner of Treatment is pretty much the ſame: It is however to be obſerved that *Scirrhi* or *Sarcomata* are the hardeſt of any of theſe Tumors; next to theſe come *Steatomata*; all the reſt are ſtill ſofter, and may require ſome Variation in their Treatment according to their degree of Conſiſtence. Thoſe Tumors ſeated in the Neck, which are called *Strumous* and *Scrophulous*, are commonly thought to be the Glands in the Neck indurated; but I have frequently obſerved *Steatomata* and other Encyſted Tumors in the adipoſe Parts of the Neck. For it ſeems ſcarce poſſible that thoſe very ſmall Glands which are ſituated in the Neck, ſhould grow to ſuch a ſtupendous Bulk as ſometimes to hang over the Abdomen: Whereas thoſe in the adipoſe Parts may eaſily do ſo. But beſides theſe, there are alſo frequently leſſer Tumors in the Neck, which ſeem to be thoſe Glands indurated and much enlarged, being in Fact a kind of *Scirrhi*.

Prognoſis of encyſted Tumors.

III. When Encyſted Tumors are without Pain, are neither too hard, nor too much enlarged, they preſage no great Danger, inſomuch that it is com-

[a] Lib. VII. Cap. VI.

mon for poor People, and thoſe who are afraid of the Surgeon's Hand, to bear them to the End of their Lives, without any great Inconveniency. But when they grow too large, ſo as ſometimes to weigh ten or twenty Pounds; when they cauſe violent Pains, as ſcirrhous Tumors frequently do, then, beſides the intolerable Trouble they give the Patient, they alſo add great Deformity; and, if they are not timely removed, they often occaſion a Conſumption, or Cancer, putting the Patient in imminent Danger of his Life, as we before obſerved in the Chapter of *Scirrhous Tumors*. Every one muſt know, that, in the Treatment of theſe Tumors, for a Cure, the Aſſiſtance of the Knife is conſtantly to be called in; becauſe they will not eaſily digeſt, or be brought to Suppuration, as we have already obſerved in ſcirrhous Tumors. In the mean time, thoſe Tumors are more ſafely and eaſily removed by the Knife, which are of no long ſtanding, are ſoft, ſmall, and moveable; whereas thoſe which are very large and hard, are attended with great Danger, eſpecially if they are ſeated near to large Veins and Arteries, by Nerves, Tendons, or upon the Joints; or, if they happen in feeble and old People, ſo that the Surgeon may judge from the Nature of the Tumor, and Circumſtances of the Patient, whether or no, and by what means, it is curable.

IV. With regard to the Cure of theſe Tumors, various methods are proſecuted. I am not inſenſible, that many Surgeons are for an immediate Extirpation of all Encyſted Tumors, without any more Delay; but I am rather inclined with HIPPOCRATES, firſt to try them with more gentle methods of Cure. Whenever I meet with theſe Tumors, as yet ſoft, and of no long ſtanding, I think it every way more proper to diſperſe, or elſe to ſuppurate them, before the Knife is called in for Aſſiſtance; but, on the contrary, when theſe Tumors appear to be very hard, and of long ſtanding, it ſeems moſt proper to refrain from topical Remedies. For thoſe means are ſo far from ſucceeding in the Digeſtion or Diſcuſſion of ſcirrhous and ſteatomatous Tumors, that they very often encreaſe them, and ſometimes turn them into a Cancer; whereas they might have been tolerable in themſelves for many Years, ſo that under theſe Circumſtances we muſt rely altogether on Extirpation; but if the Patient is afraid of the Knife, and will admit no Means but topical Remedies, it may not be amiſs to uſe ſome of the diſcutient or digeſtive Plaſters, of which ſort are *de Ammoniaco*, *de Galbano*, *de Ranis cum Mercurio*, *Diachylon cum Mercurio*, *de Melilot. Oxycrat. Diaſapon. &c.* SCULTETUS (in *Obſ.* 87.) aſſures us, he has cured various Encyſted Tumors of the *Meliceres* kind with *Ceratum Diaſinapios*; but before a Plaſter of that is applied, it is generally adviſeable to anoint the Part firſt with *Balſ. Peruv. Ol. Sapon. vel Petroleum, &c.* by which means the Tumor frequently diminiſhes by degrees, till it be at length diſperſed; to do which the more effectually, a little mercurial Ointment ſhould be well rubbed into the Tumor every Day before a Fire. See more concerning the Diſperſion of ſcirrhous Tumors in Part I. Book IV. Chap. XVI.

Cure by Diſcuſſing.

V. If the Tumor does not diminiſh by the Uſe of diſcutient Applications, you muſt endeavour to bring it to Suppuration; and this more eſpecially when it is of the ſofter kind, like the *Meliceris* or *Atheroma*. For this purpoſe the Application of a Plaſter of *Diachylon* with the Gums, and the Repetition of warm emollient Cataplaſms to the Tumor, are extremely uſeful; and the more ſo, if you moiſten the middle of the Tumor every Day with a little ſtrong

Cure by Suppuration.

ſtrong *Sp. Salis Ammoniaci.* When the included Matter has thus acquired a due Softneſs, and the Integuments appear a good deal extenuated, you ought then to open the Tumor by a large Inciſion, and, having diſcharged the Matter with as much as you can of its including Cyſt, the Remainder is to be brought away, by dreſſing with digeſtive or detergent Medicines; for if the Tunics of the Cyſt be not entirely diſcharged, the Tumor generally returns again ſoon after the Wound has been healed. In the Time you are deterging the Abſceſs, it may be proper to apply a *Diachylon* Plaſter externally, to keep the Lips moiſt, and better diſpoſed to unite afterwards.

Cure by Extirpation.

VI. But if the Tumor can be neither diſperſed, nor ſuppurated, but continues to enlarge itſelf, 'tis generally in that Caſe moſt adviſeable to make an Extirpation of it, before it grows too large, or degenerates into a cancerous Nature. Theſe are ſeveral methods in Practice for removing or extirpating theſe Tumors, according to their Size and Nature; thoſe which are ſmall and hard, or hang by a Root as by a Stalk, are generally beſt removed by Ligature, in the manner of Warts; by which means they wither, and fall off of themſelves in a few Days. But the moſt ready and expeditious method is to cut them off with a *Scalpel*, and then to heal up the Wound; but if in removing them this way, you divide a conſiderable Artery, you may ſtop it by ſome potential, or even the actual Cautery, or elſe by taking it up with a Needle and Thread. Laſtly, theſe Tumors may be often removed by the Application of cauſtic or corroding Medicines retained about the Root by means of Plaſters, Compreſſes, and Bandage, and when you find the Root of the Tumor almoſt corroded through, the reſt may be divided by the *Scalpel*.

Removal of the larger kinds.

VII. If the Root of the Encyſted Tumor appears too large for it to be conveniently taken off by Ligature, you muſt then remove it either by the Knife or Cauſtics, though the latter is uſualy preferred by moſt Surgeons. In order to extirpate it by the Knife, you muſt firſt make a longitudinal Inciſion upon the Tumor, and, if that does not appear ſufficient, make another Inciſion acroſs the former, till you think the Wound large enough for taking out the Tumor, in order to which you next dilate the Integuments, and ſeparate them from the Cyſt of the Tumor, by the Aſſiſtance of your Fingers and the *Scalpel*; by which means you are to take it out whole, if poſſible. That you may ſucceed the better in the Operation, it will be proper for an Aſſiſtant to diſtract or dilate the Lips of the Wound, either with Hooks or his Fingers, and to wipe up the Blood as it flows, with a Sponge, that the Surgeon may not be impeded in his Work. When the Tunic, or Cyſt of the Tumor appears, which is uſually pretty white and hard, the Surgeon is then to take hold of, and elevate the Tumor with the Fingers of his left Hand, if the Tumor be ſmall enough; but if it be too large to be thus held and elevated, it may be done by another Aſſiſtant with the Hook, *Tab.* VIII. or the *Forceps*, *Tab.* XXIII. *Fig.* 1, or elſe he may paſs a crooked Needle and ſtrong Thread croſs-wiſe under the Tumor, and by that means elevate it, while he circumſpectly frees it from the adjacent Parts, which is generally done with moſt Eaſe in the moveable kind of theſe Tumors; but in the more fixed, the Taſk is pretty difficult. But in thus freeing the Tumor, the Surgeon muſt be cautious not to injure any important Part that may be contiguous; and if the Tumor, to be extirpated, is either in the upper or lower Extremities, where perhaps a large Artery or

Vein is to be divided, in that Caſe the *Tourniquet* may, and even ought to be firſt fixed upon the Limb, which Circumſtances being duly obſerved, Tumors of this Nature have been ſucceſsfully extirpated, of many Pounds Weight, and which have been not only lodged in the fleſhy Parts, but have even adhered to the Bones and Jaws [a].

Treatment after Extraction.

VIII. The Tumor being thus carefully extracted, if the Wound and Hæmorrhage be ſmall, you may preſs the Lips together with your Fingers, and by covering the ſame with Lint and Compreſſes, retained with a proper Bandage, the Patient is generally cured in a few Days time. But in Caſe of a profuſe Hæmorrhage, the Blood is to be ſtopped, either by Ligature, Aſtringents, or the actual or potential Cautery, as we have directed more at large in Part I. Book I. Chap. II.

Removal of Fragments of the Cyſt.

IX. But if by Neglect or Accident the including Cyſt of the Tumor ſhould be broke or wounded in its Extraction, Care muſt be afterwards taken entirely to remove it, otherwiſe the Tumor will ſpeedily return. Indeed if the Tumor be either a *Scirrhus*, *Sarcoma*, *Steatoma*, or a glandular Part, the Contents are hard enough to make a clean Extirpation of it, notwithſtanding its including Coats be wounded; but when the Matter of the Tumor is ſoft or fluid, by its eſcaping, the Tumor will become flaccid, ſo that it will be hardly poſſible to make a clean Extirpation of the Cyſt without leaving ſome Fragments behind, which muſt in that Caſe be brought away, by dreſſing the Abſceſs with Digeſtives, and deterging with *Præcipitat. rub. Alumen. uſt. Ung. Ægyptiac. &c.* mixed with your digeſtive Ointments; by which means, having cleared the *Sinus*, you may incarn and heal, as in other Wounds, without the Danger of a Relapſe.

Uſe of Cauſtics in theſe Tumors.

X. If you rather chuſe to remove Tumors of this kind by the Uſe of Cauſtics, you muſt, in that Caſe, apply a piece of *Lapis infernalis*, *Butyr. Antimon.* &c. upon it, defending the other Parts by a perforated Plaſter, as we directed Chap. XIX. Sect. IV. But, in my Opinion, this is not a ſafe Practice in thoſe Encyſted Tumors, which are hard, large, inveterate, and painful, or inclining to be cancerous; for thus you may eaſily turn a *Scirrhus* into a real Cancer; and even in others 'tis hardly poſſible thus to erode them quite away without inducing violent Pains, Fever, Hæmorrhage, and other malignant Symptoms, to the Hazard of the Patient's Life. It is therefore, in the general, much better to have Recourſe to the Knife for the Removal of theſe Tumors, when they are large and hard, notwithſtanding we now and then meet with an Inſtance of their being ſucceſsfully extirpated by Cauſtics. But if the Tumor appear ſoft, and yielding, like the *Atheroma* or *Meliceris*; in that Caſe I frequently apply a Cauſtic, ſo as to make a Way through the Integuments and Cyſt, or elſe dividing them by an Inciſion in the middle, I diſcharge their Contents, and then deterge and incarn as in other Abſceſſes; which laſt method I take to be milder than an Inciſion, and Extirpation of the Cyſt by the *Scalpel*.

[a] See Roonhuysen Obſ. I. pag. 4. Sculletus *cum notis* Tilingii. Pechlin Obſ. pag. 542. Petit *apud* Garengeot *Chirurg.* Tom. II. Cap. *de Tumor. Tunicat.* Le Dran, *&c.*

CHAP.

CHAP. XXIX.

The Method of extracting foreign Bodies from Wounds.

WE meet with very little in the ancient Syſtems of Phyſic and Surgery concerning the Extraction of Bullets, which may poſſibly be, in ſome meaſure, owing to their not being ſo much in Uſe, or at leaſt not ſo fatal formerly as now; we indeed read in CELSUS[a], that leaden Balls were uſed by Soldiers in War before the Birth of CHRIST; but then I ſuppoſe they were only flung by Slings or Bows, the deſtructive Powder being at that Time unknown. For the ſame Reaſon we alſo meet with no Directions for extracting Fragments of Bomb or Granade Shells, which are of a later Invention; but then they are more large in the methods of removing the Ends of Darts, Spikes, Arrows, Swords, and ſuch like Weapons. And though, at this Time of Day, Arrows are hardly ever uſed but among barbarous Nations, yet it may not be here improper to give brief Directions for their Extraction, if they ſhould chance to come under the Surgeon's Care; and, in doing this, we ſhall find that almoſt the whole Buſineſs conſiſts in drawing out the Head, ſo as that its protuberant Beard or Hooks may not wound and lacerate the contiguous Parts. If it appears to be lodged but ſuperficially under the Integuments, it will be beſt to draw it out the ſame way it entered, provided you firſt dilate the Wound ſufficiently by Inciſion, rather than give occaſion for any of the adjacent Parts to be lacerated; otherwiſe it may be thruſt forwards, and drawn out in the Direction of its Point in the oppoſite Side, having firſt made an Inciſion to meet it; which laſt method is moſt eligible, when the Weapon has deſcended very deep, ſo that there is much leſs Space for it to paſs onward, than to be drawn back again, and alſo when it has paſſed beyond any large Blood Veſſels, or Nerves, ſo that it would induce a Laceration of them, to draw it back; and therefore, to avoid them, it muſt be thruſt forward through an Inciſion made in the neareſt and moſt convenient Part of the oppoſite Side. The method of extracting the Ends of Spikes, Swords, Sticks, or the Fragments of Glaſs, Paper, Cloaths, *&c.* you may find in Part I. Book I. Chap. I. Sect. XXXIII. and, in the third Chapter following, you will find the method of extracting Bullets and Grains of Gunpowder, in Gunſhot-wounds. Laſtly, if any of theſe foreign Bodies have ruptured a large Blood Veſſel in the upper or lower Extremities, ſo as to excite a profuſe and dangerous Hæmorrhage, it will, in that Caſe, be immediately neceſſary to apply the *Tourniquet* upon a convenient Part of the Limb before you ſearch for the Body, which being extracted, the next Step is to ſecure the ruptured Veſſel, and dreſs the Wound.

[a] Lib. VII. Cap. 5.

CHAP.

CHAP. XXX.

Of Sutures of Wounds.

I. THERE are two kinds of Sutures uſed by Surgeons in Wounds, the firſt of which is made with a Needle, and diſtinguiſhed by the Name of the *true* or *bloody Suture*; the other is made by the Application of ſticking Plaſters, and is termed the *dry* or *falſe Suture*. Sutures are not to be uſed indifferently in all Wounds, but in thoſe chiefly, in which the Lips cannot be cloſely approximated by Deligation, as in many of the tranſverſe, oblique, or angular Wounds, which have been lately inflicted, are quite free from any foreign Bodies, and are not attended with any Loſs of Subſtance: In many of which a Suture will be of great Service, not only by expediting the Healing, or Union of the Wound, but alſo by procuring a ſmaller and neater Cicatrix. The dry Suture is uſed chiefly in ſuch Wounds as are ſuperficial, of no great Depth or Length, and particularly for thoſe inflicted on the Face; though even in theſe there are ſome Surgeons, who prefer and make the true Suture; but I think the different Circumſtances and Diſpoſitions of Wounds may very well direct the Surgeon ſometimes to one, and ſometimes to the other kind of Suture: For what need is there of ſtitching up a Wound whoſe Lips may be well approximated, and retained together by Plaſter and Bandage? I think the Needle ought in ſuch Caſes to be ſpared, both for the Eaſe of yourſelf and the Patient. But, on the contrary, in large and deep Wounds, where the Lips cannot be cloſely retained by Plaſter and Bandage, or in thoſe where the Part is almoſt amputated, or hangs by a little bit, as in the Noſe, Ears, Cheeks, Chin, Forehead, Fingers, *&c.* there you ought immediately to conjoin the Lips by Suture with Needle and Thread. The kinds and uſes of Sutures.

II. As we have already ſufficiently explained the Method of making Sutures in Wounds (in Part I. Book I. Chap. I. Sect. XXXIX. *& ſeq.*) we ſhall here only add a few neceſſary Cautions, as, 1. That you ought always to ſhave the Hair of the Part clean off with a Razor, before you attempt to conjoin the Lips of the Wound by dry Suture, with ſticking Plaſters. 2. That when one Plaſter does not well retain the Lips, you muſt apply ſeveral, either by the Side of, or acroſs each other, as in *Tab.* IV. *Fig.* 4, 5, 6. You are alſo to obſerve, 3. That the true Suture with Needle and Thread is of two kinds, Simple and Compound: The firſt of which comprehends the *knotted*, the *Glover*'s, and *circumvoluted Suture*. And, among theſe, the firſt is ſo called from its diſtinct Knots, *Tab.* IV. *Fig.* 16. the *Glover*'s from its Reſemblance to the Suture uſed by theſe Artiſts, and by the Surgeon for Wounds of the Inteſtines, *Tab.* IV. *Fig.* 20. The *circumvoluted Suture* is when the Thread is wound about the Needle, after it has been entered through both Lips of the Wound, as in *Tab.* IV. *Fig.* 21, 22. for the Hare-lip; in treating of which we ſhall deſcribe it more particularly. The Suture of a Tendon is alſo of a particular kind, as we ſhall deſcribe in our Chapter of uniting divided Tendons, by this means, in the End of our Operations. Beſides theſe now mentioned, there were various other Sutures uſed by the ancient Surgeons, as the *Sutura Sartoria*, *Sutura Celſiana*, *& clavata*, the laſt being made upon Quills or cylindrical Sticks, as in *Tab.* IV. *Fig.* 19. Directions for Sutures.

But we ſhall not inſiſt upon a particular Deſcription of theſe, which have been long out of Uſe; only we may obſerve, that the *Sutura clavata* has been lately revived, and recommended, with a little Variation, by PALFYN and GARENGEOT, who, inſtead of Sticks or Quills, uſe a bit of Silk ſpread with Cerate, and rolled up into a Cylinder. 4. Laſtly, you muſt obſerve, that, in the Suture of deep Wounds, it is frequently neceſſary to introduce a Tent, and leave it at the bottom of the Wound; till its Fundus appears well deterged, that you may heal it from the bottom upwards.

CHAP. XXXI.

Of Separating Adheſions betwixt the Fingers and Toes.

Adheſions of the Fingers together.

I. WE frequently meet with new-born Infants, having ſeveral of their Fingers or Toes cohering, or grown together, either by a ſtrict Adheſion of their Fleſh, or elſe only by looſe Productions of the Skin, as in the Feet of Ducks and Geeſe: Though the ſame Diſorder is alſo ſometimes found in Adults when their Fingers or Toes have been neglected, after an Excoriation of them in Burns or Wounds; to be freed from which Malady the Patient is deſirous of invoking the Surgeon's Aid, partly to be rid of the Deformity, but chiefly to recover the proper Uſe of the Fingers. Theſe Adheſions may be ſeparated in a two-fold manner, according to the nature of the Diſorder; *i. e.* either by cutting out the intermediate Skin with a Scalpel, or Pair of Sciſſors, or elſe barely by dividing them from each other with thoſe Inſtruments when they cloſely adhere. But to prevent their Coheſion again for the future, you muſt inveſt each of the Fingers ſeparately with a ſpiral Bandage about an Inch broad, and dipt in *Aq. Calcis cum Sp. Vini*, according to the Figure in our laſt, or XXXIXth Plate, on Bandages.

Or with the Palm of the Hand.

II. Sometimes the Fingers, inſtead of adhering to each other, grow to the Palm of the Hand, as I have more than once obſerved from Wounds or Burns; ſo that they cannot by any means be extended, or drawn back to open the Hand. For the ſake of Beginners, I ſhall recite the Method by which I cured three of theſe Patients. Firſt, I carefully ſeparated the Fingers from their Adheſions with the Palm, without injuring their Tendons, and, after dreſſing them with vulnerary Balſam, and ſcraped Lint, I extended them on a Ferula of thick Paſteboard, in which extended Poſture I treated the wounded Fingers ſeparately, till they were healed; but at every Dreſſing you ought to move the Fingers gently, to prevent a Rigidity or Stiffneſs of their Joints.

CHAP. XXXII.

Of Amputating diſeaſed and ſuperfluous Fingers.

INfants are ſometimes born with ſupernumerary, miſhapen, and miſplaced Fingers, of various kinds, ſome with Nails and Bones, and others without, reſembling fleſhy Excreſcences. When the Deformity or Incumbrance of theſe make

their Amputation neceſſary, it may be conveniently enough performed, either by the Scalpel, or a pair of Sciſſors; eſpecially when there are no Bones in them; for if there are Bones, you muſt amputate with a ſtronger pair of Sciſſors for the purpoſe, able to cut through the Bones. If there are ſeveral of theſe Fingers, and the Infant appears too weak or infirm, to have them all amputated at one time, it is beſt to take them off at ſeparate and convenient Intervals, intermitting a few Days, ſo as to amputate the next, when the preceding is near well. The Hæmorrhage may be ſtopped with dry Lint and Compreſſes, or ſuch as have been dipt in *Spir. Vini*, and the Wound next healed with ſome vulnerary Balſam, as in others. In the Year 1718, I cured an Infant of three Weeks old, after taking off a ſuperfluous long Finger, which grew to the Thumb, which had a long Bone, and a ſort of Spur like that of a Cock, inſtead of a Nail; ſee *Tab.* XII. *Fig.* 15. I proceeded, firſt, by making an Inciſion through the Skin all round it with a Scalpel, and then cut through the Bone with a ſtrong pair of Sciſſors; this done, I ſtopt the Hæmorrhage, which was inconſiderable, with Lint dipt in *Sp. Vini*, and a cloſe Bandage, and the Wound was afterwards ſpeedily healed with vulnerary Balſam. I could recite many more Cures of the ſame kind made by myſelf; but as the Method uſed was the ſame in all, they are not here neceſſary to be mentioned, ſince this alone will ſuffice.

CHAP. XXXIII.

Of Amputating ſphacelated Fingers and Toes.

I. FINGERS and Toes are uſually amputated by the Surgeon, chiefly upon three Accounts; 1. when they are ſo contuſed and ſhattered by Bullets or other Inſtruments, that they cannot be reſtored and preſerved: 2. when they are ſphacelated, or totally mortified, either from Cold, Contuſions, or other Cauſes: And, laſtly, 3. when they become carious, cancerous, or ſcirrhous, ſo as to be curable by no Remedies, or Applications whatever, as I have met with frequent Inſtances. Nor is it uncommon for the Fingers of Maſons, Carpenters, and other Labourers, to be accidentally cruſhed, ſo as to make an Amputation of them unavoidable. See ROONHUYSE, *Obſerv. Chirurg.* XXV. When it is neceſſary to amputate Fingers and Toes.

II. Before the Surgeon proceeds to amputate Fingers or Toes, he ought to be firſt well aſſured, that there is no poſſibility of preſerving them ſound and entire; and therefore if they appear to be but ſlightly cruſhed, or only beginning to be infeſted with a Gangrene, he ought to treat them with diſcutient and ſpirituous Applications, to prevent the Diſorder from ſpreading itſelf, at the ſame time reducing and retaining the bony Fragment by his Fingers, and Deligation, as in other Fractures. But if they are ſo violently cruſhed as to hang but by a little bit, I know no great reaſon why they ſhould not be immediately taken off, either by the Sciſſors or Scalpel, as they alſo ſhould, when any one Joint is completely ſphacelated; for Delays are, in thoſe Caſes, frequently very dangerous. But if any of the Fingers or Toes ſhould be cut off by any ſharp Inſtrument, ſo as to hang by a bit, the Wound being recent, though large, you Cautions to be firſt obſerved.

ought not to take off the pendulous Part, but replace it immediately, ſecuring it well by Plaſter and Deligation, and this even when the Part is cut quite off, but obliquely; for I knew an Inſtance of a Butcher's Finger, that was cut quite off obliquely, but being immediately fixed, and retained in its proper Place by Deligation with a Linen-rag, it adhered, and became well without any other Medicines. At leaſt, it is always beſt to try if it will not adhere, before you cut it off, and reject it; ſee *Chap.* LXXII. following.

Method of amputating.

III. The manner of Amputating is chiefly threefold, either 1. by a pair of ſtrong *Sciſſors*, or rather ſharp-edged *Pincers*, treating the Wound as we before directed in the preceding Chapter; or, 2. by the *Mallet* and *Chiſſel*, *Tab.* XII. *Fig.* 17. with which the vitiated Parts are taken off at one Blow, as I have frequently done in cancerous Affections with a Caries or *Spina ventoſa* in the Fingers; and ROONHUYSE has alſo thus ſucceſsfully amputated the Great-toe, being ſcirrhous, notwithſtanding what others may ſay againſt this Method. Or, laſtly, 3. the diſeaſed or mortified Parts are amputated by dividing in the next ſound Joint with a *Scalpel*, leaving or drawing back a large Part of the Skin, to wrap over the Stump, that it may heal the ſooner. This laſt Method of Amputating is preferable to the former, in that you are, by this means, certain to avoid any ſupervening Caries, or a ſplintering of the Bone; for which reaſons I have uſed it with Succeſs for removing Thumbs and Fingers, even of old People, in the Articulation of them with the Metacarpus, when they have been totally deſtroyed by a Caries or Mortification. Some indeed imagine this Method of Amputating in the Joint to be not ſo convenient, becauſe a Cicatrix or Skin cannot be induced over the Cartilage; which is however an Obſtacle that I never yet met with, and may at worſt be eaſily avoided, by drawing back and leaving a large Part of the ſound Skin on, and by removing the cartilaginous Extremity of the metacarpal or metatarſal Bone; by which means the Bone and Skin will more intimately unite and adhere. After the Amputation your Dreſſings muſt be made with ſcraped Lint, Compreſs, and Bandage, as we before directed; and, if the Patient be plethoric, in order to prevent Inflammation, or a future Hæmorrhage, it may be proper to take a few Ounces of Blood from a Vein. If any of the two foremoſt Internodes of the Fingers ſhould appear to be carious, and Part of the third, it is better to amputate the vitiated Part of the laſt by the *Mallet* and *Chiſſel*, which will more expedite the Cure, than to take off the whole Finger cloſe to the Metacarpus by the *Scalpel*. But if the whole Finger or Toe is entirely to be corrupted, it muſt then be taken off in the Articulation cloſe to the Metacarpus, leaving a good deal of the Skin. See Inſtances of Great-toes amputated in LE DRAN, *Obſ.* 112, 113, and 114.

An EXPLANATION *of the* TWELFTH PLATE.

Fig. 1. Repreſents the Cupping-glaſs uſed at preſent in *Germany*, and elſewhere, for dry Cupping, or for extracting Blood after Scarification.

Fig. 2. Is the Scalpel, or Scarificator, commonly uſed by our *German* Cuppers: A the Handle, B the Edge, C the Part which is ſtruck extremely quick by the Finger, ſo as to make the Edge wound the Skin.

Fig. 3. Repreſents the Order or Poſition of the little Inciſions made in the Skin by the Cupper, that they may all be cleanly intercepted, or covered by the Cupping-glaſs, *Fig.* 1.

Plate 12.

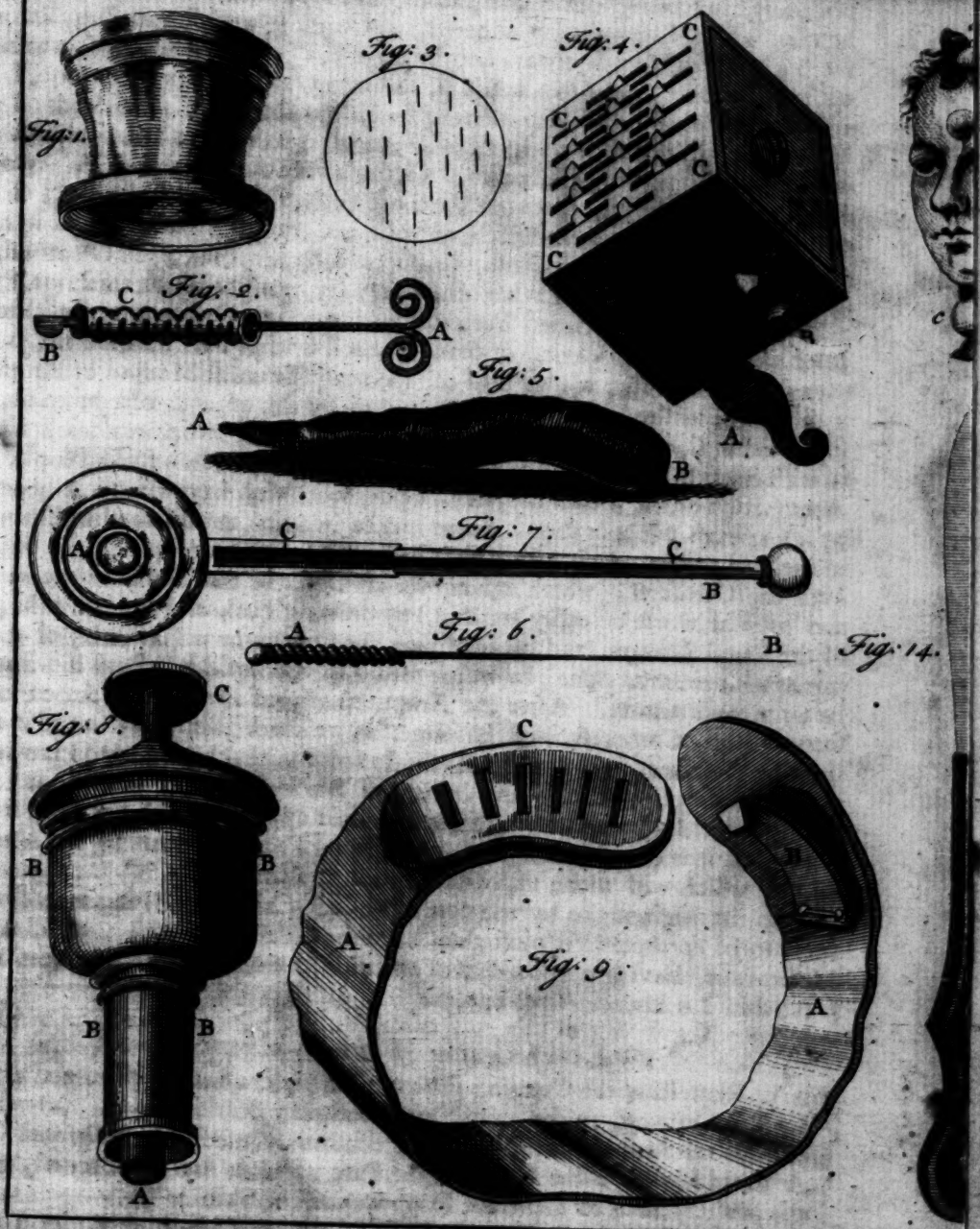
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Plate 12.

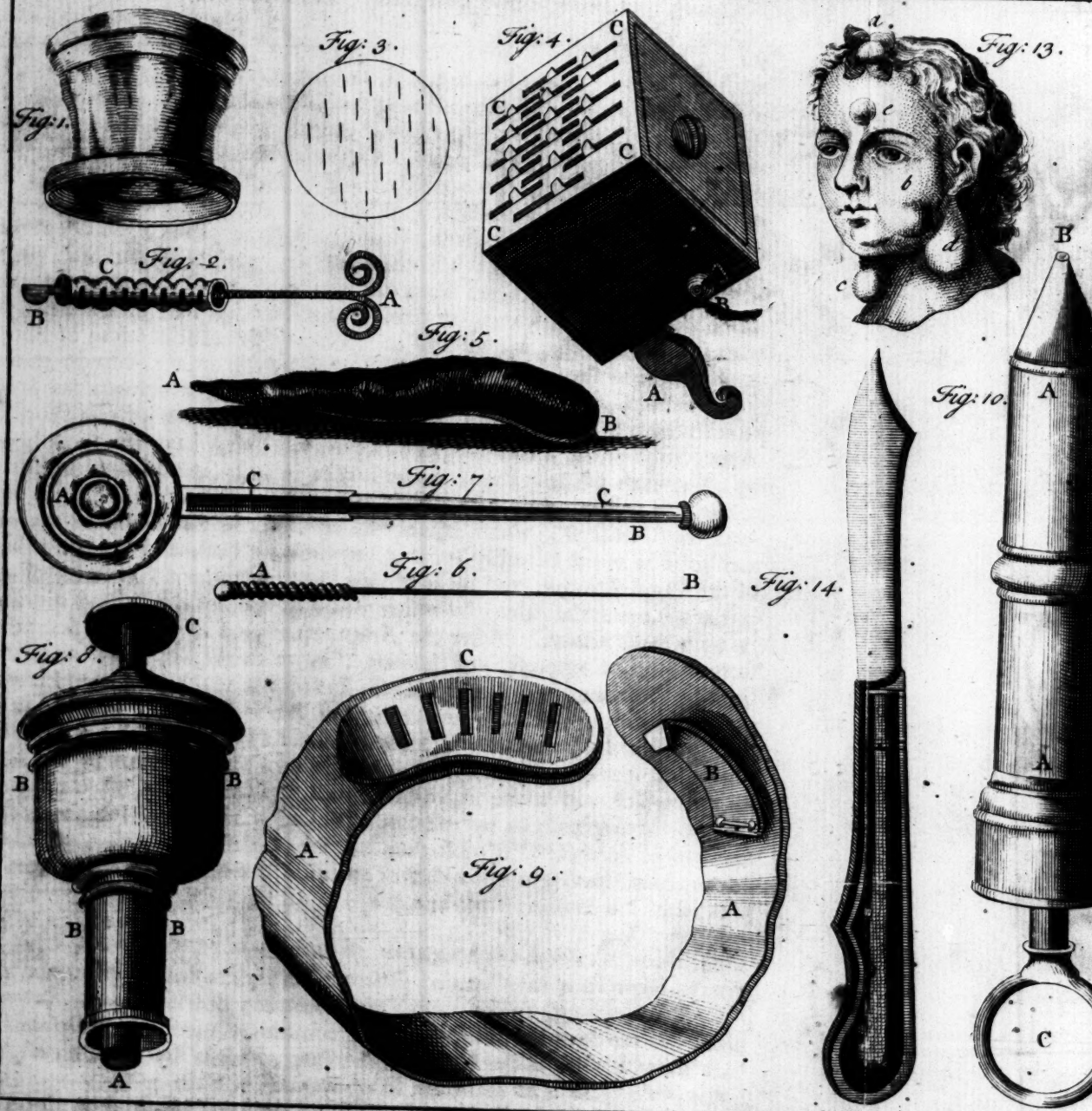
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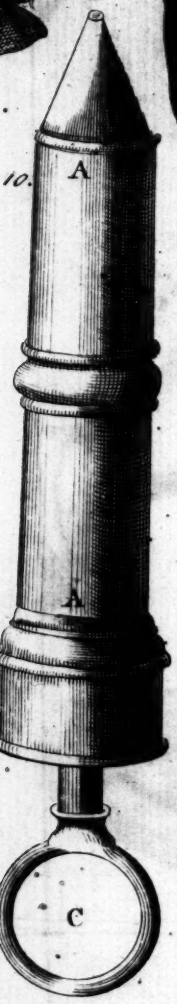
Fig: 15

Fig: 17.



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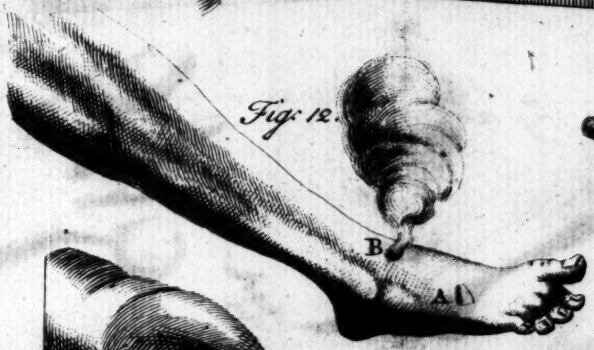


Fig: 16.

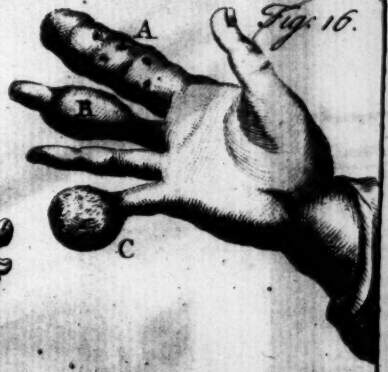


Fig: 11.

Fig. 4. Exhibits the modern cubical Scarificator, making ſixteen Inciſions in the Order of *Fig.* 3. by one Stroke upon the Skin, and with very little Pain.

Fig. 5. Gives the Form or Shape of a Leech, for the Information of ſuch as may be ignorant of that Inſect: A the Mouth or Head by which it bites, B the Body and poſterior Parts; but it muſt be obſerved, that one and the ſame Leech may, by differently contracting and expanding itſelf, appear in a hundred Shapes, ſo that its Length and Thickneſs are very uncertain.

Fig. 6. Is the Needle uſed by the Inhabitants of *China* and *Japan* for making their Acupuncturation, which they celebrate in moſt Diſorders, as we do Phlebotomy. A the Handle, B the Point which enters the Fleſh.

Fig. 7. Is the little Hammer uſed to ſtrike in the preceding Needle: A the Head of this Hammer, B its Handle, CC a Caſe in the latter to depoſite the Needle in.

Fig. 8. Repreſents the actual and concealed Cautery, uſed formerly for the making of Iſſues, and is by ſome denominated *Capſula Caſſeriana*. A denotes the End of the actual Cautery, or red-hot Iron, protruding itſelf beyond the Caſe, BB is the wooden Caſe concealing the red-hot Iron from terrifying the Patient, C the Handle, by depreſſing which the Cautery is forced into the Skin.

Fig. 9. Is a Machine to be uſed inſtead of Deligation for Iſſues in the Arm, to be made a little longer for thoſe in the Neck, Leg, or Thigh. AA is a leathern Swath of about two or three Fingers Breadth. C is a Braſs-plate with ſeveral oblong Apertures, for intercepting the Hook B of the other Plate in the manner of a Claſp.

Fig. 10. Shews the Syringe proper for injecting Liquors into the Urethra of Males, and the Vagina of Females, for various Uſes. AA the Body of the Syringe. B its Extremity, ending with an obtuſe Point inſtead of a ſmall Tube, to prevent the injected Liquor from regurgitating and flying about. C the Ring or Handle of the Sucker, by which the Liquor is drawn into, and forced out of the cylindric Body.

Fig. 11. AA ſhews the Parts of the Soles of the Feet, which the *Italian* Phyſician MISTICHELLIUS directs to be cauterized in Apoplexies, B the ſquare Iron Cautery for the Operation, which in that Diſorder, he ſays, is highly ſerviceable.

Fig. 12. Repreſents the Method of burning the Part affected in the Gout with the *Indian Moxa*. A denotes the Cone of *Moxa* not yet fired, and B one that is burning.

Fig. 13. Gives a View of ſeveral Encyſted Tumors *a*, *b*; of ſcirrhous Glands in the Neck *c*, *d*; and of a fleſhy Excreſcence or Mark from the Mother, *e*.

Fig. 14. Repreſents the ſmall Scalpel, which I generally uſe for extirpating ſcirrhous Tumors, or Glands in the Neck, Wens, or even ſcirrhous Glands of the Breaſts.

Fig. 15. Repreſents the Hand of an Infant with ſix Fingers, in which A denotes the ſuperfluous Finger with a Nail like a Cock's Spur, which I took off by a pair of amputating Sciſſors or Pincers; which Inſtrument I alſo uſe in a *Spina ventoſa*, or Caries of the Fingers.

Fig. 16. Is a Hand with a whole Index, A, carious, which I amputate cloſe to the Metacarpus by the Scalpel *Fig.* 14. but then I alſo remove the Head of the

the firſt Phalanx, that the Wound may heal the ſooner. B denotes a *Spina ventoſa* in the middle Finger, and in the ſecond Internode, which I amputate in the firſt Bone or Phalanx; C is a large Excreſcence or Protuberance at the End of the little Finger, from the ſame Diſorder, which I amputate in the ſecond Bone, both of them by the Mallet and Chiſſel.

Fig. 17. Shews the Method of amputating the Great-toe with the Mallet and Chiſſel, uſed by ROONHUYSE.

CHAP. XXXIV.

Of Amputating the Hand, Cubitus, and Humerus.

In what Caſes Amputation is neceſſary.

I. THOUGH the Amputation of Arms and Legs is indeed with ſome reaſon commonly eſteemed one of the moſt terrible and ſevere Operations in Surgery, yet there are many Caſes that occur daily in Practice, in which the Operation is abſolutely neceſſary and unavoidable, in order to ſave the Life of the Patient. Such as, 1. when the Muſcles of the Part or Limb are ſphacelated [a], 2. or when the Muſcles and Bones are moſt violently contuſed and ſhattered; 3. when there is an incurable Caries, or *Spina ventoſa* [b]; 4. when the brachial, crural, or other large Artery, is either totally divided [c], or elſe wounded, ſo as to bleed inceſſantly without any poſſibility of ſtopping the Hæmorrhage but by Ligature, in which Caſe 'tis hardly poſſible to preſerve the Limb from mortifying, or ſave the Patient's Life without Amputation; 5. and laſtly, this Operation is neceſſary in thoſe Tumors of the Hand and Arm, which ariſe from a *Spina ventoſa*, or ſome other irremediable Cauſe, the Patient being tortured with the utmoſt excruciating Pains, as deſcribed by M. A. SEVERINUS [d], BIDLOE [e], RUYSCH, *&c.* [f] In the mean time I would adviſe all prudent Surgeons, not to perform this Operation without there are other ſkilful Surgeons or Phyſicians, who alſo adviſe it, or think it neceſſary; by which means he may avoid many Reflections, which are often unjuſtly thrown upon a Surgeon without ſuch precaution.

Method of amputating the Hand.

II. To proceed regularly with Amputations in the upper Extremities, we ſhall begin with that of the Hand, which may, on ſome Occaſions, be amputated, in the manner of the ancient Surgeons, by one Blow with the Mallet upon a ſharp Chiſſel fixed near the Carpus, as the Operation is repreſented in *Tab.* LIII. of SCULTETUS, *Edit. An.* 1666. But in reality this Method is often found to be not only unſafe, but even of dangerous Conſequence, by violent contuſing or fracturing ſome of the Bones and Parts in the Carpus. It is therefore not without reaſon, that the Moderns reject this Practice for that with the Knife and Saw, with which they take off the Hand more ſlowly indeed, but more ſecurely,

[a] See Part I. Book IV. Chap. XIV. preceding.

[b] See Part I. Book V. Chap. VIII, IX. preceding.

[c] I have frequently ſtopped profuſe Hæmorrhages from the brachial Artery by Ligature, and therefore it will not be ſo often neceſſary to amputate the Arm on that Account, as many Surgeons imagine and direct.

[d] Lib. de Abſceſſ. [e] *Exercit. Medic. Chirurg.*

[f] *Epiſt. Anatom.* Problem. XIV.

pro-

provided the Saw be not uſed to the Carpus or Metacarpus, becauſe the numerous Ligaments, Tendons, and ſmall Bones there ſeated, cannot ſafely be divided by the rough Teeth of that Inſtrument. [a] The Practice of the modern Surgeons is therefore here much the beſt, who amputate the Hand by the Knife and Saw, cutting through the Bones of the Cubitus, as will preſently appear.

What is to be obſerved in amputating the Arm.

III. When the Hand, Cubitus, or Humerus, are required to be amputated upon the account of ſome incurable Sphacelus, Caries, or other Diſorder, there are then two Things chiefly neceſſary to be obſerved: The firſt of theſe is the *Place where* the Amputation muſt be made, which muſt at leaſt be one or two Fingers Breadth above the mortified Part, never in the diſeaſed Part itſelf; nor ought theſe larger kind of Amputations to be ever made in the Articulations; for (beſides other Difficulties) there being no Fleſh there to cover the Ends of the Bones, it will be almoſt impoſſible to heal the Stump [b], or prevent a Caries in the Head of the Bone, with other bad Symptoms. The next Thing required, after the proper Place for Amputation is aſſigned, according to the uſual Method, is (2.) *the Proviſion and Preparation of the ſeveral neceſſary Inſtruments* and Parts of the Apparatus, which are to be laid in readineſs upon a large Plate, or convenient Part of the Table, yet ſo as that they may be concealed from the Patient's View, who might be not a little terrified and diſheartened by them.

The Inſtruments and Apparatus required.

IV. For the ſake of Beginners, we ſhall here enumerate the ſeveral Inſtruments neceſſary to compoſe the Apparatus for this Operation; which are, (1.) the *Tourniquet* before deſcribed in Part I. Book I. Chap. II. Sect. IX. *& ſeq.* (2.) Some Ligatures, or Tapes, of a Finger's breadth, and about an Ell and a half long. (3.) A middling ſized Knife (*Tab.* XIII. *Fig.* 1.) for dividing the Skin, to draw it back. (4.) A larger Scalpel, or Knife, of a crooked Figure, (*Tab.* XIII. *Fig.* 2.) for dividing the Remainder of the Fleſh. (5.) A Catlin, or double-edged Scalpel (*Fig.* 3.) for dividing the intermediate Fleſh betwixt the Ulna and Radius. (6.) A Piece of Linen Cloth of about three Spans long and ſix Fingers Breadth, ſlit up length-wiſe about half way, as in *Tab.* II. *Fig.* 17. (7.) A well-tempered and ſharp Saw [c] (*Tab.* XIII. *Fig.* 4.) for dividing the Bones. (8.) A Pair of Pliers, or Forceps, to hold the Ends of the Arteries, (*Fig.* 5 and 6.) (9.) Some crooked Needles, armed with ſtrong Thread, or ſome Bits of blue Vitriol wrapped up in Lint or Cotton. (10.) Some ſmall ſquare Compreſſes, (*Tab.* II. *Fig.* 21.) (12.) A large Quantity of ſcraped Lint. (13.) Some aſtringent Powders, to ſtop the Hæmorrhage, or rather, as the former frequently inflames the Parts and impedes the Suppuration, provide ſome *Alcohol Vini & Oleum Terebinthinæ*, in proper Veſſels,

[a] Yet there have been ſome Surgeons who have in this manner amputated the Hand by the Saw, in the Carpus or Metacarpus, as we learn from SCULTETUS, *loc. cit.* Nor is it impracticable, in my Opinion, to amputate the Hand in its Articulation with the Cubitus by the Scalpel, as in the preceding Chapter; though I muſt acknowledge myſelf to have never yet made the Experiment.

[b] But if a ſufficient Portion of the Skin be left on to cover the Stump, it may perhaps heal as readily as the Stumps of Fingers thus amputated.

[c] The Moderns have invented other Saws and Knives for Amputating, as may be ſeen in GARENGEOT's *Tract. de Inſtr. Chirurg.* But theſe here deſcribed being equally as good in all reſpects, I ſhall not inſiſt on them.

though

though in reality we may well enough omit all of them. (14.) A large Bolſter of fine Tow, of a round Figure, and broad enough to cover the Stump, and retain the other Dreſſings; or, inſtead of this, a Piece of the Fungus called *Lupi Crepitus*, or Puff-ball, of the like Size and Figure. (15.) A Calf's or Swine's Bladder, or elſe a large Sticking-Plaſter cut in the Form of a *Malta* Croſs, (*Tab.* II. *Fig.* 15.) or three ſeparate Plaſters, two Spans long, and two Fingers broad, for inveſting and ſecuring all the other Dreſſings on the Stump. (16.) A Compreſs in Form of a *Malta* Croſs, but larger than the Plaſter. (17.) A thick ſquare Compreſs, to inveſt the End of the Limb. (18.) Three other Compreſſes of two Spans long, and two Fingers breadth. (19.) A Roller or Bandage for the Deligation of the whole, of about five Ells long and three Fingers breadth; and laſtly, (20.) Some Wine, and other cordial Medicines, to aſſiſt and relieve the Patient in caſe of a Deliquium.

Poſition of the Patient, Aſſiſtants, and Surgeon.

V. The whole neceſſary Apparatus being thus provided, the next Buſineſs is for the Surgeon to diſpoſe the Patient, Aſſiſtants, and himſelf in a proper Poſture to begin the Operation. Firſt therefore, the Patient muſt be fixed on a low Chair or Stool, in the midſt of the Room, the Surgeon ſtanding betwixt his Legs, and ſix Aſſiſtants at leaſt around him; one of which ſhould ſtand behind the Patient, to hold his Body; another on the ſide of the affected Arm, which he is to hold faſt by graſping the upper Part of the *Cubitus*; a third Aſſiſtant muſt hold the Hand, about to be amputated; and a fourth ſhould ſtand on one ſide with the Apparatus of Inſtruments, to hand them as they may be wanted by the Operator; a fifth Aſſiſtant muſt ſtand ready with the ſeveral Dreſſings, Compreſs, and Bandage, neceſſary to compleat the Deligation; and the ſixth or laſt ſhould be at Liberty to aſſiſt the Patient and Operator occaſionally, in handing Wine, Cordial, or any other thing they may want.

What muſt be done immediately before the Amputation.

VI. Things being thus far advanced, the Surgeon, who ſhould have a Napkin before him, to wipe his Hands when there may be occaſion, proceeds to fix the *Tourniquet* (*Tab.* III. *Fig.* 1. K) moderately tight about the Patient's Arm, in the manner we before directed (in Part I. Book I. Chap. II. Sect. IX. *et ſeq.*) by which means the brachial Artery will be compreſſed, ſo as to prevent any profuſe Hæmorrhage; and the Nerve being alſo a Partaker of the ſame Stricture, will make the Patient leſs ſenſible of Pain from the Operation. But to prevent the *Tourniquet* (*Tab.* III. *Fig.* 1. K) from coming looſe, the Turn-ſtick muſt be held faſt by the Aſſiſtant ſtanding behind the Patient; but if you apply the Screw-*Tourniquet*, figured in *Tab.* V. and VI. they will adhere tight upon the Part, without being held by an Aſſiſtant. This done, the Aſſiſtant holding the upper Part of the Arm, ſhould next draw the Skin ſtrongly upwards, while the Surgeon applies the Tape tight, and circularly about the Part, a little above where it is to be divided, in order to ſecure the fleſhy Parts cloſe to the Bones, that they may be cut through more eaſily and evenly. Some, as VERDUYN, uſe a Leathern Strop with a Claſp, inſtead of a Tape or Fillet, for this Purpoſe, which we ſhall conſider in *Chap.* XXXVI. *Sect.* III. following. The Surgeon now encourages his Patient with good Words, and Wine, or Cordial, before he enters on the Operation.

VII. The

VII. The Operation itſelf is next begun by an annular Inciſion made through the Skin by the Surgeon, with a ſmall *Scalpel*, the Arm being extended in a parallel or even Direction, by the Aſſiſtants; one of which Aſſiſtants is then ordered to draw the Skin upward as much as poſſible. The Surgeon next divides the Fleſh, down to the Bones, all round, cloſe by the Margin of the retracted Skin, with the large crooked *Scalpel* (*Tab.* XIII. *Fig.* 2.) by which Procedure the Skin will wrap over the Stump, and the whole will be healed a vaſt deal ſooner than by the method formerly uſed. The Surgeon now takes the *Scalpel*, with which he divided the Skin, or elſe the double-edged Catlin, *Fig.* 4. and therewith cuts through the Fleſh and Ligaments betwixt the *Ulna* and *Radius*, thereby alſo ſeparating the *Perioſteum* from the Bones where the Teeth of the Saw are to paſs, to avoid violent Pain and Inflammation from a Laceration of that nervous Membrane by the rough Teeth of the Inſtrument. This is no ſooner done, but the Aſſiſtants draw back the inciſed Fleſh above and below, to open a Paſſage to the Bones. And that the Fleſh above may be drawn up as much as poſſible, to cut off the Bone higher than the Inciſion, you muſt apply the ſlit Piece of Linen [a] (mentioned before at N° IV. (6.) ſo that its Heads being pulled upward by the Aſſiſtant who holds the ſuperior Part of the Arm, he ſtrives to elevate the Fleſh that the Bone may be taken off as high as poſſible, by which means the Stump will be more eaſily and neatly covered, and the Wound much ſooner healed. The Surgeon muſt fix his Saw in this Operation, ſo that it may work upon both the Bones of the *Cubitus* at the ſame time, without which Caution, he will be liable either to cut one of them longer than the other, or elſe occaſion a Fiſſure or ſplintering of the ſingle Bone, when it becomes ſo far divided as not to be able to bear the Streſs of the Saw. He muſt alſo move the Saw gently at the beginning, till it is well entered, and then he may go on faſter, but with Diſcretion; and to prevent the Saw from being pinched or obſtructed in motion by the Bones, the Aſſiſtant who holds the ſuperior Part of the Arm ſhould a little elevate the ſame, as the Hand ſhould be a little depreſſed by the other Aſſiſtant, ſo as to make a Space large enough for the Saw to move freely; but this muſt be done gently and cautiouſly, for fear of breaking the Bones. And thus in one minute or two the Amputation may be compleated.

The Operation itſelf deſcribed.

VIII. When the Surgeon has thus amputated the Hand with Part of the *Cubitus*, his next Buſineſs is to make a ſtrict Compreſſure and Deligation upon the larger Arteries, to ſuppreſs the Hæmorrhage. But the better to diſcover the divided Arteries, the Surgeon muſt order the Aſſiſtant who holds the *Tourniquet* to relax the ſame a little; or if it be the Screw-*Tourniquet*, *Tab.* V. or VI. he may looſen it a little himſelf, by which means the Blood ſtarting from the Arteries, will ſhew their divided Orifices. If the Patient be plethoric, the Surgeon may be leſs ſparing of the Blood at this time, which muſt be received by a proper Veſſel on the Floor; but in Caſe of Weakneſs, the *Tourniquet* muſt be inſtantly tightened again, to reſtrain the Flux. When the *Cubitus* is divided very low, near the *Carpus*, there will not be any great Occaſion to ſecure the Arteries by Ligature with Needle and Thread, becauſe the two or three Branches which run there, are but ſmall, and may be well enough

Treatment after the Operation.

[a] Some Surgeons uſe a thin Plate of Steel to elevate the Fleſh, inſtead of this Piece of Linen.

ſecured by Compreſſes of Lint with ſome Bits of *Vitriol. Roman.* or only by ſquare Linen Compreſſes [b]. But the Fleſh and Ends of the Bones are to be well ſecured and inveſted with Doſſils of dry Lint, over which again fix a large Piece of the *Fungus* called *Crepitus Lupi*, with or without a large Bolſter of Tow, to be ſecured and retained on the Stump by a wet Bladder, or a Plaſter cut in the ſhape of a *Malta* Croſs; or, inſtead of a Plaſter in that form, you may more advantageouſly apply two or three long and narrow ones acroſs each other, in the form of a Star, upon the Stump; by which the Skin may be drawn down, ſo as to cover the Wound, and procure a ſpeedy Cicatriſation. Over the Plaſters you are again to place a large Compreſs in form of a *Malta* Croſs, ſo that it may cloſely inveſt the End of the Limb, where it ſhould be held by an Aſſiſtant while the Ends are brought up and applied round the Arm. And laſtly, you muſt fix firſt one large ſquare, and then three long and narrow Compreſſes upon the Stump, ſo that the laſt may interſect each other in form of a Star, and come up towards the *Humerus*; and then you finiſh the Deligation with a long Roller, in the manner we ſhall direct at large, in treating of Bandages for the Arm.

The Hæmorrhage ſometimes ſuppreſſed by the actual Cautery, or Ligature.

IX. Moſt of the ancient, and not a few of the modern Surgeons, approve of the actual Cautery for reſtraining the Hæmorrhage from the divided Arteries; which Practice is deſervedly rejected by the moſt expert Surgeons of the preſent Time, not only for the ſevere Torture it gives the Patient, but becauſe it is at beſt very ſuſpicious, and even dangerous, eſpecially in Amputations of the *Humerus* or *Femur*, as the Eſchar formed by the Cautery very often ſeparates in two or three days time from the End of the Veſſel which it ſtopped, and thereby occaſions a profuſe, if not a fatal Hæmorrhage. However, the Uſe of the Cautery will be more likely to ſucceed in Amputations of the *Cubitus* or *Tibia*, than in the Parts before-mentioned; but even here it is beſt to follow the method at N° VIII. preceding, and never to have recourſe to the actual Cautery without abſolute Neceſſity. Laſtly, if, for the greater Security, you are deſirous of taking up the Ends of the divided Arteries with Needle and Thread, according to the modern Practice, which, in my Opinion, is not very neceſſary in Amputations at the lower End of the *Cubitus* or *Tibia*, you are in this Caſe to take hold of the End of each divided Artery with a Pair of Pliers, termed the Crow's Bill (*Tab.* III. *Fig.* 4. or *Tab.* XIII. *Fig.* 5 *and* 6.) or ſome other of a convenient make; and after paſſing round your crooked Needle armed with ſtrong waxed Thread, with the latter you tie up the End of the Veſſel.

Amputation of the *Humerus*.

X. When the Amputation is to be made above the Elbow in the *Humerus*, the Operation is to be performed almoſt directly in the ſame manner as we preſcribed for the Amputation in the *Cubitus*, only the brachial Arteries, of which there are ſometimes but one, ſometimes two or three, are to be always

[b] M. Chabert, in his *Obſ. Chirurg. Pariſ.* 1724. aſſerts the Application of Vitriol to be here unneceſſary, ſince the Blood may be ſecurely ſtopped, and the Arteries compreſſed, by properly diſpoſing Linen or Lint formed into Doſſils or Compreſſes about the Ends of the Veſſels, ſecuring them by a cloſe Deligation or Bandage; which in weak Patients I have found to ſucceed very well. Others think the Application of Cauſtics both unſafe and injurious, becauſe the Eſchar formed by the Vitriol frequently recedes or ſeparates from the Veſſel, and excites a profuſe Hæmorrhage. *V.* Ruysch *Epiſt. de novâ Methodo Amputandi*, &c.

taken

taken hold of with a Pair of Pliers, and ſecured by Ligature with a crooked Needle and waxed Thread, as we juſt before mentioned in N° IX. for in theſe large Arteries the Uſe of Styptics or Cauteries is found to be of little or no Efficacy. After the Extremities of the large Arteries are tied up, you muſt relax the *Tourniquet* a little, to diſcover the reſt; which are to be alſo ſecured in the ſame manner. Some Surgeons paſs a ſmall Needle and Thread through the End of the Artery, whilſt held by the Pliers, joining the Thread with that with which they next make the Ligature; which method they take, in order to ſecure the Ligature from ſlipping off from the Ends of the Veſſel. There are others, who, inſtead of extending the Ends of the Veſſels with a Pair of Pliers, uſe a very crooked kind of Needle, armed with very ſtrong waxed Thread, with which they perforate the circumjacent Fleſh, firſt on one ſide, and then on the other ſide of the Artery, tying up a good deal of the adjacent Fleſh together with the End of the Veſſel, in order to prevent the Thread from cutting through the arterial Coats. But I think either of theſe methods are rather inferior than preferable to the firſt, in which the Artery is extended with a Pair of Pliers, and then ſecured by Ligature with a crooked Needle and waxed Thread, paſſed round the End of the Veſſel; for in the two latter methods there is danger of paſſing the Needle wide of the Veſſel, or at leaſt the End of the Artery may eaſily fly back, or ſlip out of the Ligature.

XI. When you have dreſſed the Stump, and compleated the Deligation, according to N° VIII. the next Buſineſs is to give the Patient a Draught of Wine or ſome Cordial; and when he is laid down upon the Bed, the End of the amputated Arm ſhould be compreſſed by the Hands of an Aſſiſtant for ſome Hours, which will not only make the Dreſſings adhere more cloſely, but alſo prevent any conſequent Hæmorrhage. This done, you may by degrees relax the *Tourniquet* ſufficiently to admit of the Blood's Circulation through the Part; and if, upon the Relaxation of it, you meet with no Blood from the Wound, it is a Sign the Operation has been well compleated. In the next place you muſt recommend Reſt to the Patient, and order ſome nouriſhing Emulſion inſtead of common Drink, and paregoric Draughts to be repeated at proper Intervals, that the Patient may hereby recover his loſt Strength, and be eaſed of his Pains by Sleep. The next Day you may again looſen, or elſe totally remove the *Tourniquet*, and give Orders for a proper Diet and Regimen, ſuch as will abate the febrile Heat and Motion of the Blood, and ſecure the Patient from a freſh Hæmorrhage, as in Part I. Book I. Chap. I. N° XLIII. which Accidents may be ſtill better prevented by the Uſe of *Phlebotomy* at Diſcretion, with cooling Draughts and Powders; but Veneſection muſt be avoided, when the Patient is weak, or has loſt much Blood. If a freſh Hæmorrhage ſhould appear, ſo as not to be ſuppreſſed by the Application of another Compreſs and Bandage, with compreſſing the Stump for ſome time with the Hands, which are generally ſufficient, in that Caſe you muſt re-apply the *Tourniquet*, and, after removing the Dreſſings, make a freſh Ligature upon the Ends of the Arteries; or if the Ends of the Arteries cannot be taken hold of, you may apply the actual Cautery, and defend the Stump with a larger Quantity of Lint, then ſecure it with an exact Deligation and Compreſſure for ſome time by the Hands, till the Hæmorrhage ceaſes.

Treatment after the Dreſſing.

When and how to renew the Dreſſings.

XII. The firſt Dreſſings and Bandage ought not to be removed from the Stump before the third or fourth Day, when the Mouths of the divided Veſſels may be ſuppoſed to be well cloſed and united; but in caſe of Accidents, intenſe Pains, Inflammation, Hæmorrhage, or the like, you muſt renew them ſooner. Nor is it amiſs to order a Servant to attend conſtantly for the firſt Week at the Patient's Bed-ſide, provided with a *Tourniquet*, with which an incidental Hæmorrhage may be ſuppreſſed, till the Surgeon can be called to renew the Deligation. But if every thing ſucceeds well, in renewing your Dreſſings, you ought to remove them one after another very tenderly, and thoſe which are next, or adhere to the Wound, ſhould not be touched at all, much leſs violently forced away, if you are deſirous to avoid irritating the Part, and inducing an Hæmorrhage. 'Tis in this Caſe much the beſt for you to leave the adhering Dreſſings upon the Part for a few Days, and to moiſten them at each Dreſſing with warm Wine or its Spirit, till they become looſe, and ſeparate ſpontaneouſly in the Suppuration, without uſing any Violence; and, after the firſt Dreſſing, you need not dreſs again above once every other Day, or every Day at moſt, except your Diſcharge be great, and in the Summer-time.

What is to be obſerved in the Dreſſings.

XIII. In renewing your Dreſſings, it is chiefly neceſſary for you to obſerve, that your Wound be well and gently cleanſed from all the foul Matter with Lint, and then to dreſs it with flat Plates or Pledgits of ſcraped Lint, of which that next the Wound ſhould be armed with ſome digeſtive Ointment, and the reſt applied dry. The Pledgits of Lint are to be ſecured and retained upon the Stump by three, four, or ſix ſticking Plaſters of *Emp. Diapalmæ*, or the like, of about a Foot in length, and a Thumb's breadth, croſſing each other upon the Part like a Star; and over theſe Plaſters muſt again be fixed a large ſquare Compreſs, and over that three other long and narrow Compreſſes in a ſtellar Poſition, ſecuring the whole by Deligation with your Roller. When your Dreſſings have been thus continued for about a Fortnight, there will not be occaſion for ſo much Lint nor ſo many Compreſſes as at firſt, nor need you then make your Bandage ſo tight, as there is no Danger of any Hæmorrhage: But in the mean time you muſt continue to treat the Wound with digeſtive Ointments and vulnerary Balſams, retained with Lint, a Plaſter, Compreſs, and Bandage, as in other Wounds, till it be healed, which uſually happens in about two Months. For the reſt, it may be here proper to adviſe the Surgeon to apply the *Tourniquet*, before he removes the firſt Dreſſings, eſpecially in Amputations of the *Humerus* or *Femur*, in order to prevent an Hæmorrhage, or at leaſt the brachial Artery ſhould be compreſſed in the middle of the Arm by the Thumb of an Aſſiſtant.

Treatment of the Fever.

XIV. Laſtly, as Amputations are often followed ſoon after with a Fever, eſpecially in plethoric and ſtrong Habits, it will in that caſe be neceſſary to uſe *Phlebotomy* with paregoric and cooling Medicines, joined with a proper Regimen and Diet; without which there may be Danger of loſing the Patient, either by the Violence of the vulnerary Fever, as it is termed, a Sphacelus of the Part, or other bad Accidents.

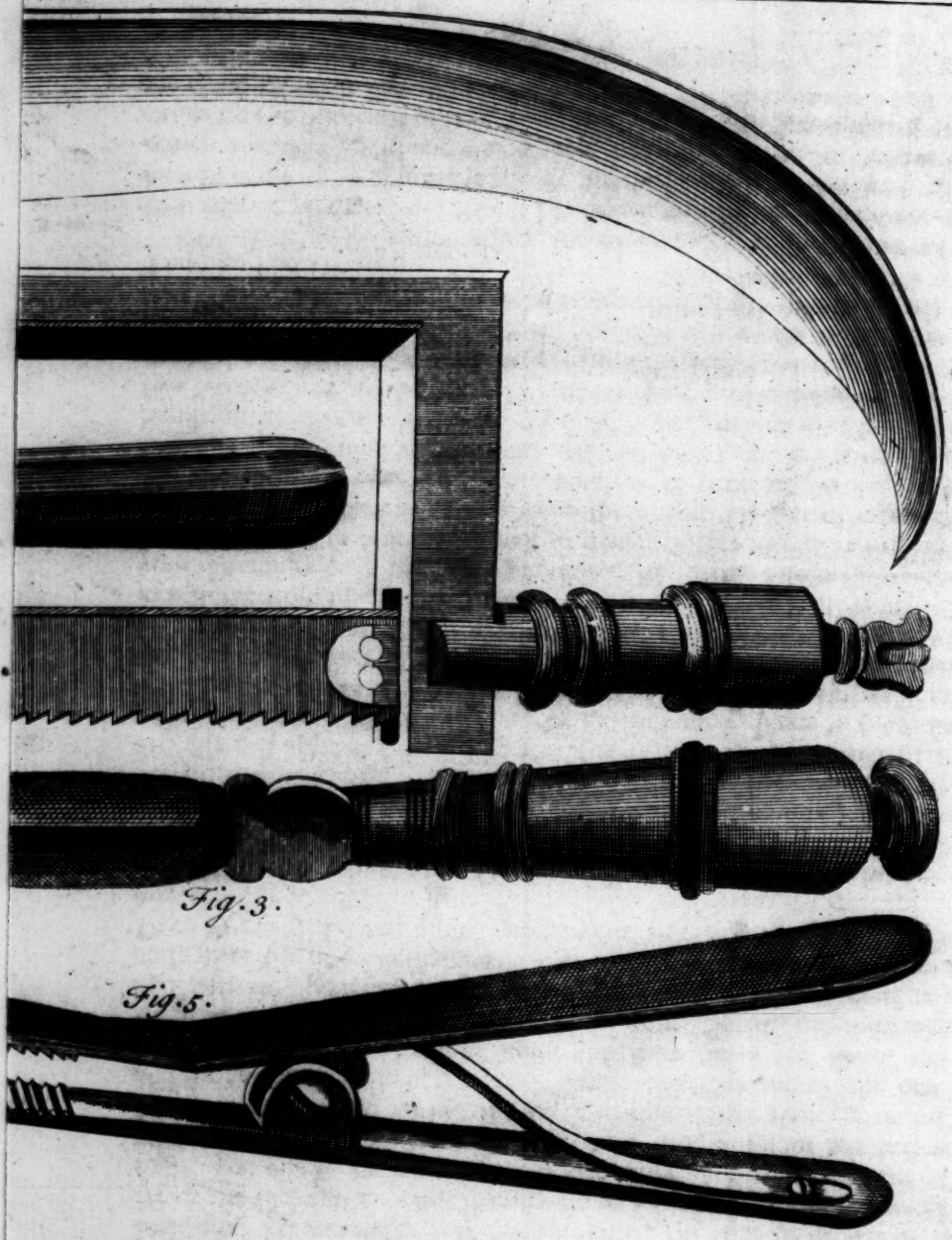


Fig. 3.

Fig. 5.

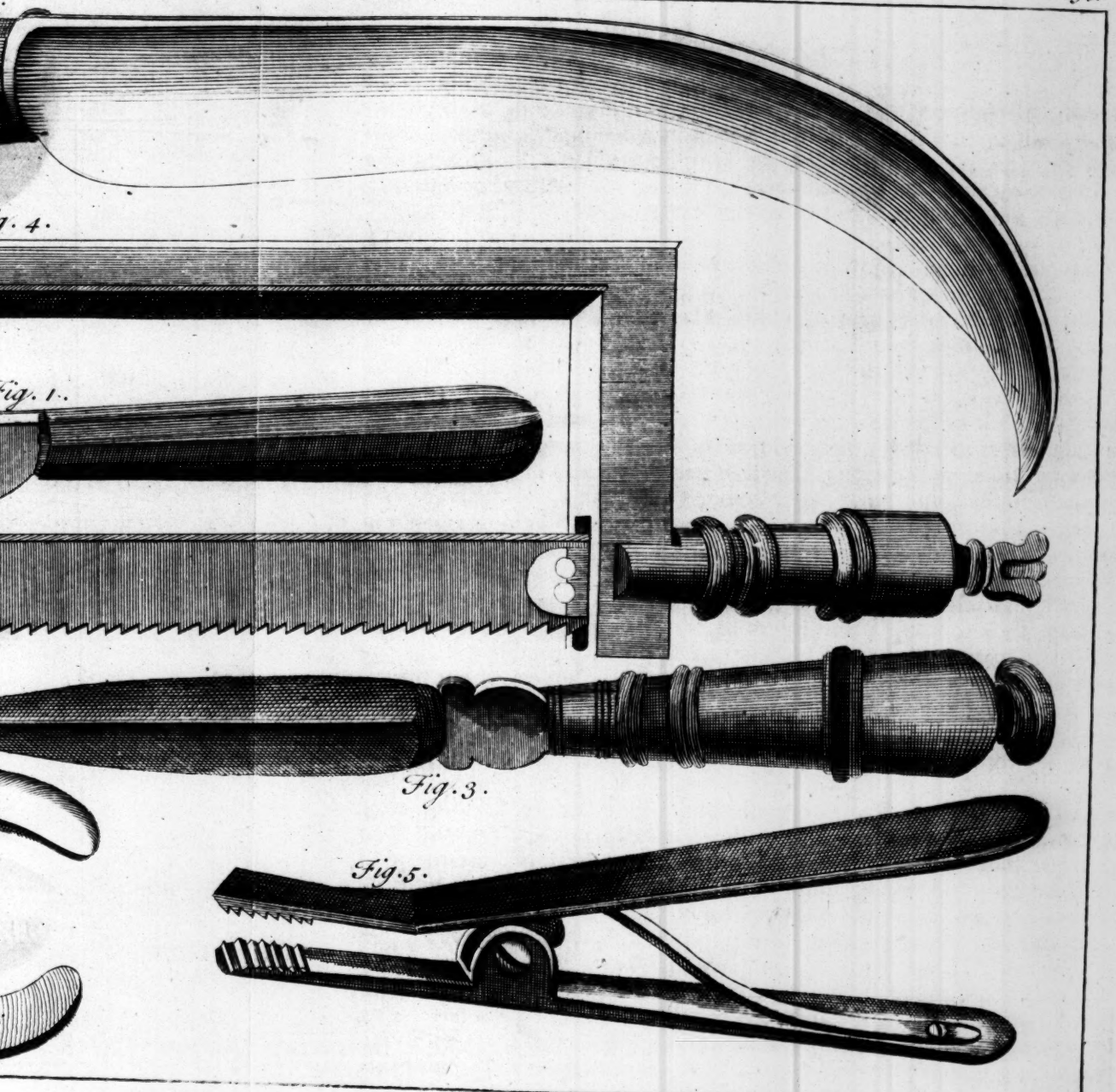


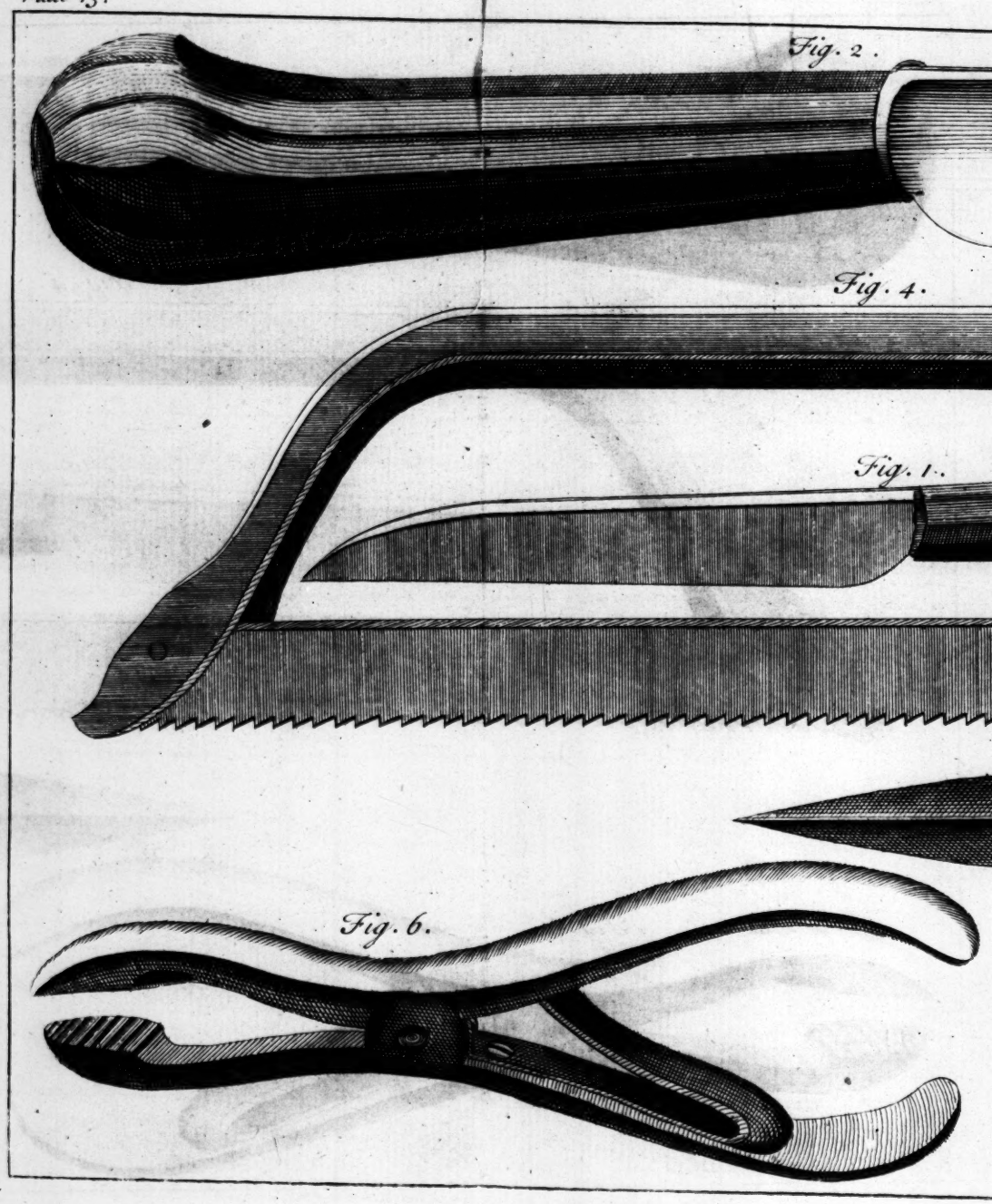
Fig. 4.

Fig. 1.

Fig. 3.

Fig. 5.

Plate 13.



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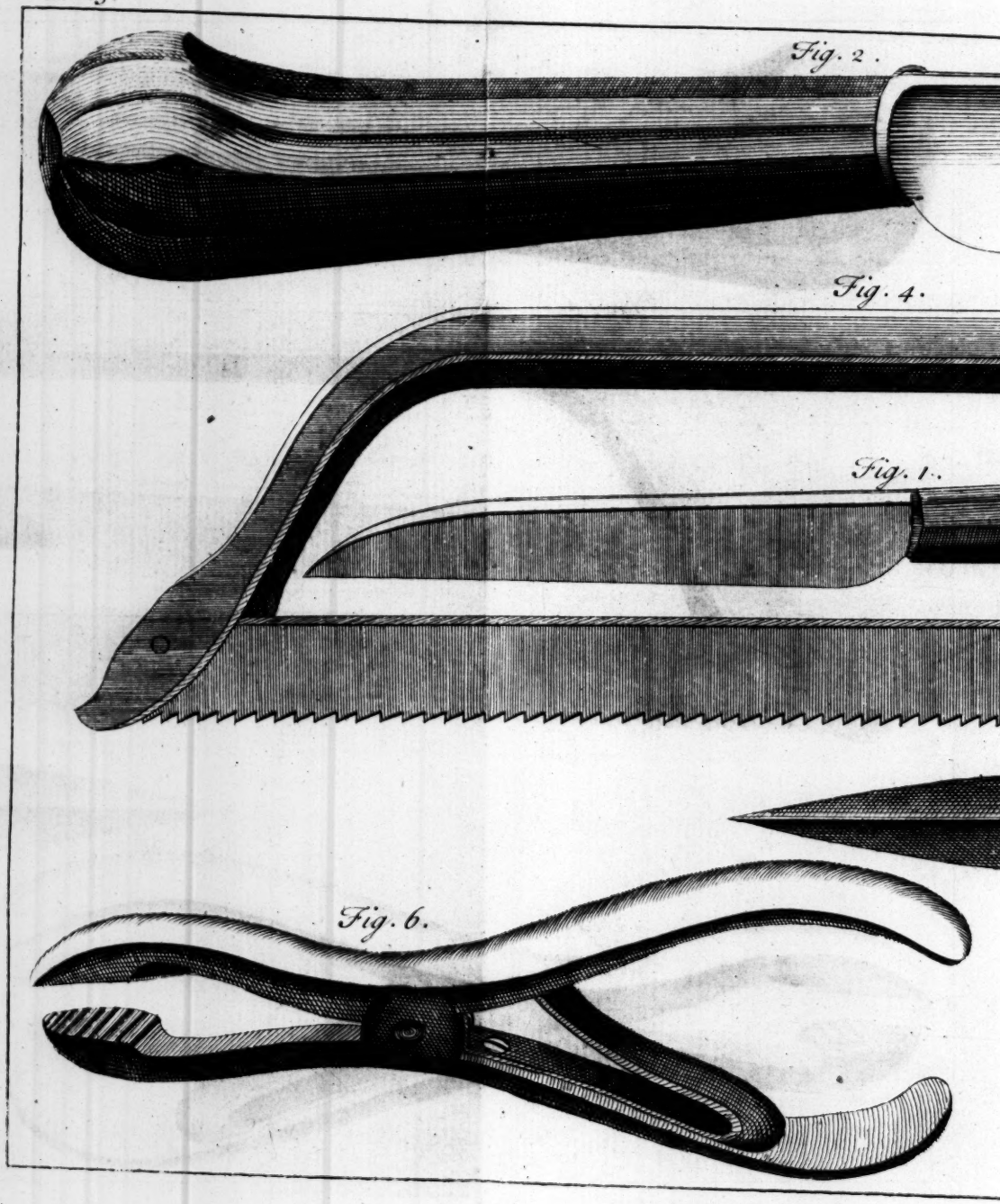

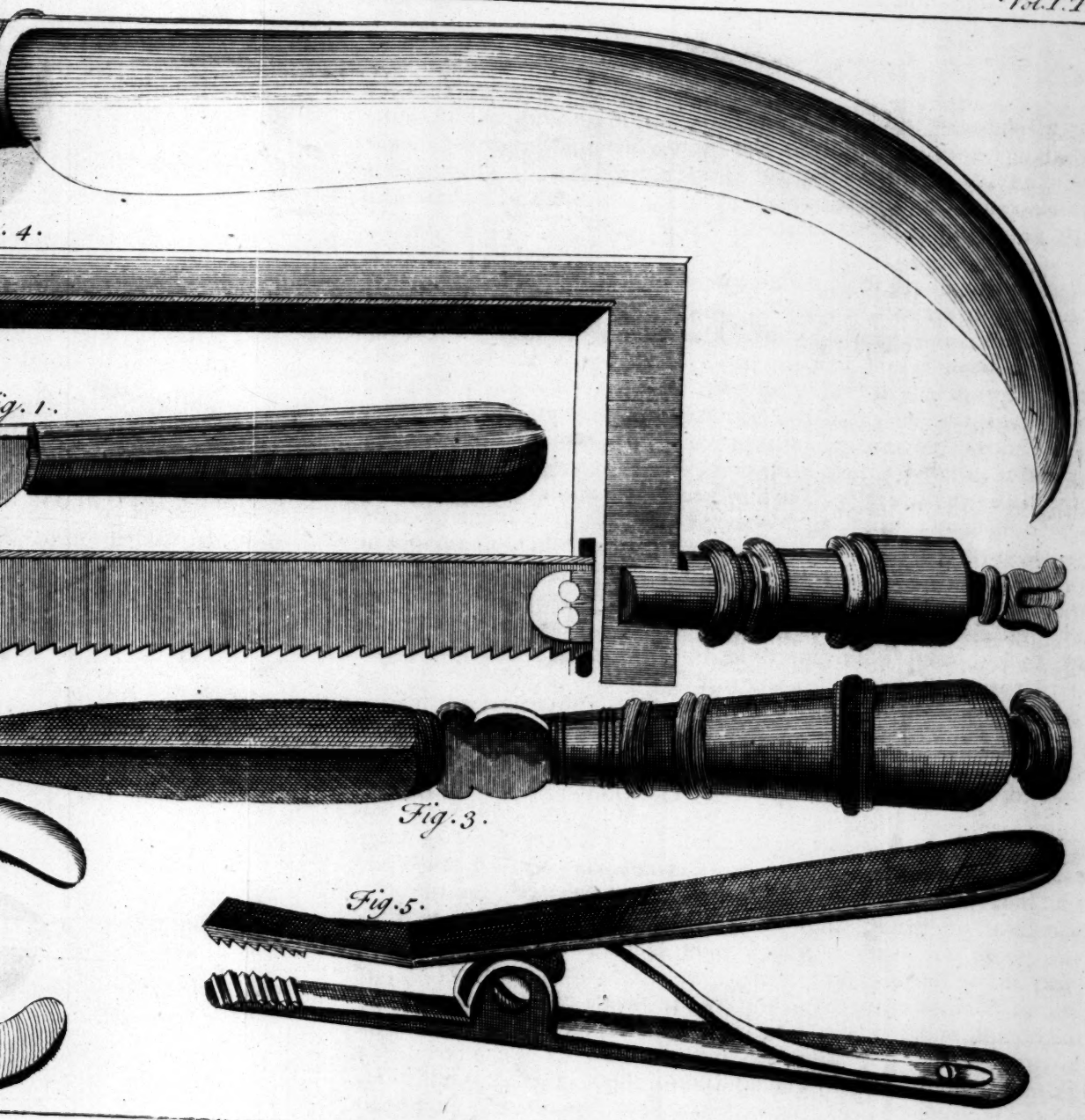

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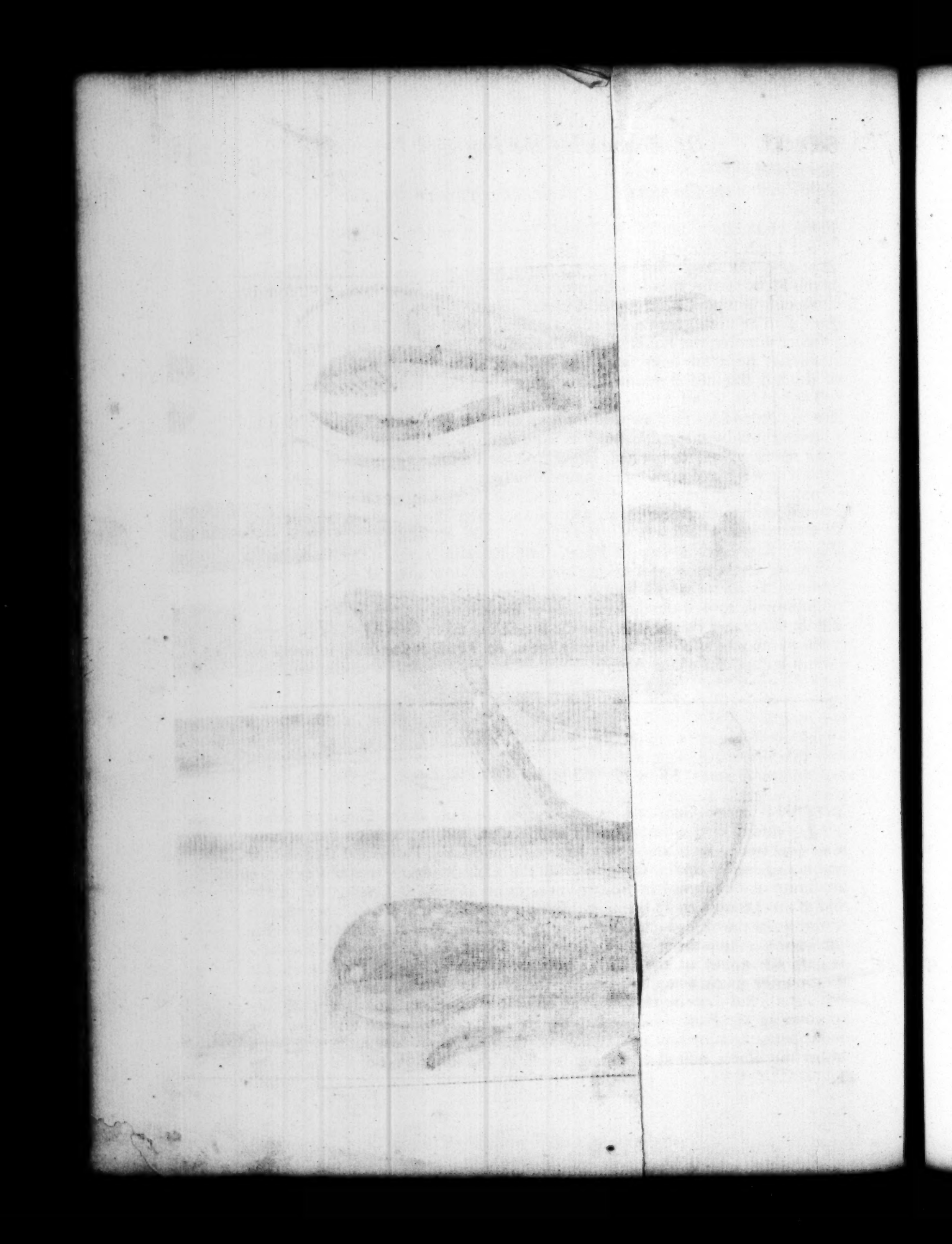

An EXPLANATION *of the* THIRTEENTH PLATE.

Fig. 1. Exhibits a ſmall ſized *Scalpel*, more commodious for dividing the Skin and Fleſh in Amputations than the large crooked one following.

Fig. 2. Is the large crooked or falciform Knife, commonly uſed for dividing the Fleſh to the Bone in Amputations of the upper and lower Extremities, though in moſt Caſes I prefer the ſmall one, *Fig.* 1.

Fig. 3. The Catlin, or double-edged *Scalpel*, for diving the Fleſh and Ligament betwixt the Bones of the *Cubitus* and *Tibia*, which may be alſo performed by a leſs and ſingle-edged *Scalpel*, like that in *Tab.* I. G. This Knife is alſo uſed in the method of amputating the *Tibia*, which preſerves the Calf.

Fig. 4. Repreſents the Saw uſed for amputating Bones of the Limbs. This Inſtrument is by many delineated as large again as our Figure of it; but a Saw of the ſame Size, or but little larger than our Figure, will perform the Operation as well, and even more commodiouſly than a larger. This and the two preceding Inſtruments are uſually embelliſhed with various Ornaments, which may ſerve to encumber them, and enhance their Price, but can add nothing at all to their Uſefulneſs.

Fig. 5. Repreſents a Pair of Pliers, furniſhed with Teeth at one End, and a Spring at the other, for taking hold of the Ends of divided Arteries, in order to ſecure them by Ligature with ſtrong Thread, and ſtop their bleeding in Amputations of the upper and lower Extremities.

Fig. 6. Is another Pair of Pliers for the ſame Uſe, taken from M. GARENGEOT; which may be alſo made with very flat or no Teeth at the End, to avoid injuring the Coats of the Artery.

CHAP. XXXV.

Of Amputating the Foot and Leg.

I. THE ancient Surgeons, in amputating the Foot at the *Tarſus* or *Metatarſus*, uſed a large Chiſſel and Mallet, and ſometimes a Pair of large Cutting-Pincers, with which they ſeparated the diſeaſed Parts, and then treated and healed the Wound with Balſams in the uſual manner; which Practice is confirmed and explained by SCULTETUS, in his *Armament. Chirurg. Tab.* LIV. But as the Tendons and Ligaments, ſeated in thoſe Parts, are in this Method violently lacerated and contuſed, the modern Surgeons have therefore juſtly preferred the Amputation of the Toes and *Metatarſus* by the *Scalpel*, conducting the Remainder of the Cure as in other Wounds; and in this manner the Leg may be much better ſupported by the Heel or Stump, than by a wooden Machine. But becauſe they were afraid of this Practice, from the Difficulty of covering the Bones, and healing up the Wound, they rather followed the more dangerous method of amputating the Leg about four Fingers breadth below the Knee, inſtead of taking it off in the lower Part of the *Tibia*; by which

The Place for amputating the *Tibia*.

which means, though they cut off a large Part of the Leg which was not yet diſordered, they avoided the Deformity and Inconvenience in ſitting down, which the Patient would have met with from preſerving it on; for a long Stump of the Leg can neither be ſtood upon nor well adapted to a wooden Machine; and therefore it was thought moſt convenient to amputate it in the upper Part of the *Tibia*, about a Hand's breadth below the *Patella*, to avoid injuring the Tendons of the flexor Muſcles, and the better to adapt the Knee to a ſilver or wooden Leg. I am indeed ſenſible that many Surgeons, even at preſent, approve of amputating no higher than the Diſorder has ſpread itſelf, agreeable to the Advice of SOLINGEN, VERDUYN, and DIONIS; but I think their Authorities ought to be but little regarded, not only becauſe of the Difficulty there will be of adapting a wooden Machine to the lower Part of the *Tibia* above the Ancle, but alſo upon the account of the Deformity which the long Stump of the Leg will occaſion, if the wooden Machine is adapted to the Knee.

Obſervations peculiar to Amputations of the *Tibia*.

II. With regard to the Inſtruments and Dreſſings uſed in this Operation, they are almoſt the ſame which we before deſcribed for amputating the Arm, only it may be here neceſſary to obſerve, or add a few Cautions which relate more particularly to Amputations of the *Tibia*; ſuch as, (1.) To place the Patient upon a low Seat or Bed, ſo that he may lean backward, and extend his Legs. (2.) To ſhave off the Hair with a Razor from the Part where the Amputation is to be made, to prevent the Plaſters, afterwards applied, from adhering to them, ſo as to give the Patient intenſe Pain in removing them. (3.) To ſecure the divided Arteries, which appear in the Stump of the *Tibia*, rather by Ligature, with Needle and Thread, than by Styptics, or actual and potential Cauteries; for though theſe Arteries do not appear very large, yet if they are not ſecured by Ligature, they generally open and bleed profuſely ſoon after the Deligation, eſpecially if the crural Artery be not well ſecured with narrow Compreſſes and Bandage. (4.) The crural Artery is to be compreſſed with the *Tourniquet*, either of the common ſort, turning with a Stick, or the modern Screw-*Tourniquet*; or elſe you may make a ſtrict Ligature above the Knee with a Bandage twiſted in a cylindrical Form, ſo as to compreſs the Artery deſcending in the Ham, as in *Tab.* XIV. *Fig.* 4. D; though, in my Opinion, it is much better to apply the ſame Ligature higher up upon the Thigh, in order to compreſs the Artery, eſpecially when the *Tibia* is to be amputated near the Knee. See *Tab.* III. *Fig.* 1. L M; by which means the Dreſſings may be more conveniently applied after the Operation, than if the *Tourniquet* was fixed nearer to the Knee.

VERDUYN's method of amputating.

III. We have another new method of amputating the *Tibia* propoſed by VERDUYN, in a Diſſertation upon the Subject in the Year 1696; which Practice he ſtrongly recommends for the public Good; though he does not pretend to be the original Author of it. There are indeed many who attribute the Honour of inventing this Operation to one SABOURIN of *Geneva*, as GARENGEOT, and ſome other Members of the Royal Academy, who aſſert, that in their Time VERDUYN performed the Operation firſt at *Geneva*, and then at *Paris*; when at the ſame Time I find the Operation deſcribed and performed by the *Engliſh* Surgeons LOWDHAM and YOUNG, in an *Engliſh* Treatiſe concerning the wonderful Virtues of Oil of Turpentine in Hæmorrhages, together

together with a new method of Amputating, by JAMES YOUNG, 8*vo*. *Lond.* 1679. The ſame Operation was afterwards improved and deſcribed by my Friend KOENERDINGIUS, Surgeon of the Hoſpital at *Amſterdam*, in his *Dutch* Treatiſe *De Gangræná & Sphacelo, Cruráque amputandi Ratione veteri ac novâ*, 8*vo Amſtel.* 1698; which was the ſame Year in which VERDUYN twice performed this new method of Amputation; a brief Deſcription of which is as follows: Firſt, the *Tendo Achillis* is divided from the Ancle by the *Scalpel*, *Tab.* XIII. *Fig.* 3. then a longitudinal Inciſion is made upwards, and the Tendon ſeparated from the Bones of the Leg as high as the Part where the Bones are to be amputated by the Saw; ſee *Tab.* XIV. *Fig.* 4, 5, 6, 7. This done, the Fleſh compoſing the Calf of the Leg, *Fig.* 6. A, is drawn backward with a Cloth towards the Ham, by the Hand of an Aſſiſtant; and then the Integuments and Fleſh upon the forepart, and betwixt the Bones, are divided in the uſual manner, by a proper *Scalpel*, *Tab.* XIII. *Fig.* 1 *and* 3; and the Bones next amputated by the Saw; then the Fleſh is brought over, and adapted to the Stump of the *Tibia*, after it has been firſt waſhed with Spirit of Wine; and if there be any unequal and ſuperfluous Parts, they are cut off with a *Scalpel*, the Remainder being retained in its proper Situation by ſticking Plaſters, or a few Stitches with Needle and Thread. Laſtly, Compreſſes with a wet Bladder and Bandage are applied in the manner we before directed, in treating of Amputations in general; or inſtead of them may be uſed a retentive Machine, figured by VERDUYN and GARENGEOT, for the Purpoſe, being made of Leather, with Straps and Buckles, by which the Stump being ſecured, it is then to be compreſſed for a few Hours by the Hands of an Aſſiſtant, till there is no Danger of an Hæmorrhage; to prevent which, you may alſo apply the Screw-*Tourniquet Tab.* V. *Fig.* 6. or *Tab.* VI. *Fig.* 1. Thus the Operation is compleated, the Advantages of which to the Patient, according to the fore-mentioned Authors, are many; ſuch as, (1.) The Calf of the Leg being thus preſerved and adapted to the Stump, cloſes and compreſſes the Mouths of the divided Arteries, ſo as to prevent an Hæmorrhage, without the Uſe of Cauteries, or the Application of Ligatures. (2.) The Ends of the Bones being thus immediately covered with the Fleſh, are not ſo liable to be infeſted with a *Caries*, as they frequently are in the common method, which greatly retards, if it does not fruſtrate the Cure. (3.) The Fleſh of the Calf readily unites with the Ends of the divided Bones of the Leg; ſo that by treating the Wound with vulnerary Balſams, in the ſubſequent Dreſſings, the Cure is ſpeedily compleated. Laſtly, (4.) The Fleſh thus adapted to the Ends of the Bones, ſerves as a Pillow ever afterwards to ſupport them; ſo that the Patient may eaſily ſit down, without being obliged to bend the Stump, as he muſt do after the common method. Add to this, that the Stump may be adapted perpendicularly to a hollow wooden Leg, ſo that the Patient may ſtand or walk upright upon an artificial Leg, as upon his natural one. Every time the Stump is dreſſed, the Portion of Fleſh which wraps over it, muſt be gently ſupported, and preſſed up againſt the Ends of the Bones, that its Weight may not make it ſeparate or ſubſide, ſo as to prevent its uniting. A more particular Account of this method may be ſeen, illuſtrated with proper Figures, in the fore-mentioned Treatiſe of VERDUYN.

IV. Not-

VERDUYN deſerts his method.

IV. Notwithſtanding the before-deſcribed method had been ſeveral times performed with Succeſs by VERDUYN and ſome others, yet it met with the Approbation of but few Surgeons; ſo that it was not able to prevail over the common and received method of amputating the *Tibia*; inſomuch that it was ſoon after deſerted even by its own Patrons, VERDUYN and KOENERDINGIUS; to which add, that the Patient, upon which SABOURIN performed this Operation at *Paris*, died ſoon after, as did ſeveral at *Amſterdam*; at which laſt Place ſeveral Patients were troubled with acute Pains, and other bad Accidents, from little Splinters, or the rough Ends of the Bones irritating the Fleſh, even after the Stump was healed up; not to mention the large Quantity of Blood loſt by SABOURIN's Patient, which was ever greater than in the common method of amputating, which, with other Inconveniences, induced KOENERDINGIUS to prefer the common before this new method, in his Treatiſe on this Subject. Notwithſtanding all this, we find M. GARENGEOT, who ſeems to be ignorant of the fore-mentioned Writings of YOUNG and KOENERDINGIUS on the Subject, endeavouring lately to recommend and re-eſtabliſh this uncommon method of amputating; as may be ſeen in *Chirurg. Operat. Chap.* of Amputations of the *Tibia*. M. GARENGEOT there relates, that there were ſeveral Men then living in *France*, who had the Operation happily performed on them in this manner; ſo that they could not only ſit down eaſily, but alſo leap very nimbly. But if we would reaſonably expect to ſucceed in this method, the Patient ought to be not only healthy in all other reſpects, but the Caſe which requires the Limb to be amputated ſhould be from ſome external Violence.

The ſame method practicable in the *Humerus*.

V. Laſtly, it is to be obſerved, that the new method of amputating, which we have been now deſcribing, may, according to the Opinion of our modern Surgeons, be not only performed in the *Tibia*, but alſo in the *Cubitus*, by preſerving a Quantity of the Fleſh and Integuments, to wrap over the Ends of the Bones; agreeable to which, the Operation was in the ſame manner performed with Succeſs by RUYSCH, in the Preſence of VERDUYN and BORTELIUS his Kinſman. See the Treatiſes on this Subject by YOUNG and KOENERDINGIUS; alſo RUYSCHII *Epiſt. Problemat.* XIV. *de novâ Artuum decurtandorum Methodo.*

CHAP. XXXVI.

Of Amputating the Thigh.

Amputation of the *Femur*, when neceſſary.

I. THE Surgeon frequently finds it neceſſary to amputate the Leg above the Knee, removing Part of the Thigh itſelf, when a Mortification has reached the Joint, or when the lower Head of the *Femur* is *carious*, *ſphacelated*, cruſhed to pieces, or the large crural Artery irrecoverably wounded; in which Caſes the Succeſs of the Operation is very dubious, eſpecially when the Amputation is made very high up in the Thigh. Nor is the Patient in Danger of being loſt only from a profuſe Hæmorrhage, from the Diviſion of ſo large an Artery as that of the *Femur*, but the Quantity of Matter diſcharged daily

daily from ſo large a Wound does often ſo much extenuate and weaken the Patient, that he cannot ſubſiſt till the Cure is compleated. Therefore whenever the Surgeon finds it neceſſary to amputate in the *Femur*, he ought to do it as low as poſſible, as near within three Fingers breadth of the Knee as he can, leaving a good deal of Fleſh, and more of the Skin, to wrap over the End of the Stump; by which means the Cure of the Wound will be much expedited, the Diſcharge of Matter at each Dreſſing rendered leſs profuſe, and the Patient, not being ſo much impaired in his Strength, will be more likely to get happily through the Cure.

II. The Application of the *Tourniquet* for compreſſing the crural Artery, whether it be the common one with the cylindric Ligature and Turn-ſtick, or the Screw-*Tourniquet*, muſt be made upon the upper and internal Part of the Thigh, as near as you can to the Place where the Head of the internal *Vaſtus*-Muſcle and the *Triceps* touch each other, as in *Tab.* III. *Fig.* 1. L M. Without which precaution you may be liable to have ſuch a profuſe Hæmorrhage from the large femoral Artery as will inevitably deſtroy your Patient, as frequently happened to the ancient Surgeons before the Invention of the *Tourniquet*. Application of the *Tourniquet*.

III. With reſpect to Amputations of the Thigh in general, little more need be added to what has been ſaid on this Operation in Arms and Legs: Such as, in the firſt place, to let the Hair be ſhaved off, and after you have made a circular Inciſion through the Integuments with a ſmall Scalpel, *Tab.* XIII. *Fig.* 1. to extend or draw them upwards as much as poſſible, before you divide the Fleſh, or Muſcles; which laſt you muſt amputate a good deal higher than the circular Inciſion through the Integuments. You may cut through the muſcular Fleſh at your ſecond Inciſion, either with the Scalpel, with which you divided the Integuments, or with the Knife for amputating Breaſts in *Tab.* XXII. *Fig.* 7. or elſe with the large crooked Knife in *Tab.* XIII. *Fig.* 2. with either of which you muſt cut all round cloſe to the Bone; by which method of proceeding you will have the Stump of the Bone covered over with Fleſh and Skin in a little time, ſo as to be healed in a few Days, and at the ſame time you avoid the riſque of a *Caries* in the Bone from its being expoſed to the Air, as we once before obſerved. For want of this precaution in Amputations of the Thigh, when the Muſcles have been divided even with the Integuments, the Muſcles have contracted, and drawn themſelves up to ſuch a degree, that I have frequently ſeen the Bone ſtanding out like a Stick for above two or three Fingers breadth from the Fleſh; in which Caſe the Patient muſt be a long time, and be much weakened by the Diſcharge of Matter, before the Muſcles can be extended and brought down, ſo as to cover the End of the Bone, without which the Cure can never be compleated. With regard to the Hæmorrhage in Amputations of the Thigh, that muſt be always prevented by making an exact Ligature upon the femoral Artery, which is much too large to be ſafely ſecured by any other Method; and, for the ſame reaſon, your Ligature upon it muſt be very firm and ſecure, by tying it up with a ſtrong Thread paſſed round after the End of the Artery is extended or drawn a little out from the Fleſh with a Pair of Forceps, or a Tenaculum, *Tab.* XIII. *Fig.* 5, and 6. If there appear to be more large Arteries than one divided, they muſt be alſo ſecured by Ligature in the ſame manner; but for the ſmaller Arteries, it may be ſufficient to cloſe them by Styptics, or Vitriol, and Doſſils of The Method of amputating and dreſſing the *Femur*.

ſcraped Lint without Ligature. The Dreſſings and Deligation are to be much the ſame for an amputated Thigh, as we before directed for an Amputation of the *Humerus*; only the Quantity of Lint, *Fungus*, Bladder, Compreſſes, *&c.* muſt be proportionably larger, and the Bandages much longer; to which you muſt here add a long, thick, and narrow Compreſs, to be impoſed all along the Thigh over the crural Artery, and ſecured there by a Bandage peculiar to itſelf; or, inſtead of this, you may fix the *Tourniquet*, *Tab.* V. *Fig.* 6. or *Tab.* VI. *Fig.* 1. and leave it upon the Limb for ſome time. The Deligation being compleated, and the Patient put to Bed, his Thigh muſt be placed in an eaſy elevated Poſture on a Pillow, that the *Impetus* of the Blood, on the End of the Artery, may be leſs than in a direct Poſition, which will greatly conduce to the Prevention of a freſh Hæmorrhage. Laſtly, the Stump ſhould be compreſſed for ſome time by the Hands of an Aſſiſtant, ordering a proper Diet, Regimen, Medicines, *&c.* as we obſerved in Amputations of the *Humerus*.

Treatment of Limbs amputated by Gun-ſhot.

IV. If part of a Leg or Arm ſhould be carried away by a Bullet-ſhot, or Cannon-ball, or be tore off by a Cart-wheel, or ſome ſuch other Machine, the firſt Step to be taken by the Surgeon in theſe Caſes, is 1. immediately to apply the *Tourniquet* to compreſs the Artery, and ſtop the Hæmorrhage; and then, 2. to cut off the rough Ends of the Bone by the Saw, or cutting Pincers, that there may be no Points or Splinters to irritate the ſenſible and fleſhy Parts. But if there are no Splinters, or rough Parts, the Surgeon need not cut off any thing. Laſtly, 3. to ſecure and cloſe up the Ends of the wounded Arteries, either by Ligature, when they are large and acceſſible, or elſe by the Cautery, or by Compreſſure with Lint, Styptics, and Compreſſes, according as particular Circumſtances may indicate to the Surgeon; which being performed, the reſt of the Dreſſings and Deligation are to be compleated in the manner we have before directed for other Amputations.

Botallus's Method of amputating rejected.

V. The celebrated *French* Phyſician Botallus, formerly invented a very expeditious Method of amputating Limbs in an Inſtant, by letting a ſharp Inſtrument fall down upon them, from a certain Height, loaded with a great Weight; by which means the Limb is ſtruck off at one Blow, without the Uſe either of Knife or Saw. Botallus has been alſo ſeconded in this Method of Amputating by Hildanus; notwithſtanding which the Artifice has been reaſonably rejected by almoſt all the prudent Surgeons, who have ſucceeded them; for 'tis hardly poſſible that a Limb ſhould be taken off in this manner, without ſhattering or ſplintering the Bone. Conſult Botallus in his Treatiſe *de Vulneribus Sclopetorum*.

The adapting of artificial Limbs.

VI. After the Stump is healed up, the Surgeon may provide an artificial Limb of Silver, for thoſe who can afford it, or of Wood for others; adapted to the Stump, ſo that it may be faſtened on by Strops and Buckles, or by Springs: Of which Machines we are furniſhed with various Specimens in Amb. Parey, Hildanus, Solingen, *&c.* and by our modern Artiſts, who make theſe kinds of Inſtruments, and other curious Machines. But, for the poorer ſort, it may be ſufficient to ſupply them with a wooden Machine, turned and cut into a proper Shape, with a Hollowneſs or Cavity at the upper End for receiving the Stump of the Knee, that they may, by this means, be enabled to walk, or ſit down, though not in an elegant manner.

VII. As

VII. As a *Caries* of the Bone is no unfrequent Accident in Amputations, the Surgeon ſhould therefore endeavour to guard againſt it as much as poſſible; even at its very firſt Appearance he ſhould ſtrive to remove it, either by the Application of *Euphorbium*, or the actual Cautery, becauſe it prevents the Progreſs of the Cure; notwithſtanding the Writers in Surgery uſually paſs by this Accident, without taking notice thereof. There ſtill remains a Practice which, in my Opinion, will very often ſucceed beyond either *Euphorbium*, or the Cautery, and that is to exfoliate or pare off the diſeaſed Part of the Bone with a Knife or Raſp, till you come to the ſound; by which means the Fleſh will then readily unite with the Bone to compleat the Cure, which it cannot while the *Caries* remains. Removal of a *Caries*.

CHAP. XXXVII.

Of Amputating the Arm in its Articulation with the Scapula.

I. THOUGH I never yet attempted to amputate the *Humerus* in its Articulation with the *Scapula*, nor ſo much as found it treated of by any of our Chirurgical Writers, except LE DRAN, *Obſ.* 43. after whom the Operation is deſcribed, without mentioning his Name, by GARENGEOT, (*Chirurg. Operat.* Cap. 54.) yet that the Surgeon may be not ignorant of what has been advanced on this Head, I ſhall make it the Buſineſs of this Chapter to give a brief Deſcription thereof. The Deſign of this Chapter.

II. According to the two laſt mentioned Authors, there are two Caſes in which it may be neceſſary to amputate the Arm in its Articulation at the Shoulder: The firſt is, when the upper Part of the *Humerus* is violently contuſed and ſhattered by a Cannon-ball, Bomb, or Granade; the other Caſe is, when the upper Head of the *Os Humeri* is irrecoverably vitiated from ſome internal Cauſe, as from an Abſceſs, a *Caries*, or *Spina ventoſa*, to which we may add, a Mortification of the Arm extended to the Shoulder, *&c.* When the Arm may be thus amputated.

III. But before you enter on this dangerous and difficult Operation, it will be abſolutely neceſſary to have evey member of your *Apparatus* of Inſtruments and Dreſſings prepared and diſpoſed each in their proper Order; after which you are to fix the Patient upon a convenient Seat with his Face covered. You muſt next obſerve, that the *Tourniquet* is not here fixed upon the Arm, as we before deſcribed for the common Amputation of it; but that Inſtrument is in this caſe laid aſide, and the Trunk of the brachial Artery is firſt ſecured by Ligature in the following manner, before you begin to amputate. Previous Requiſites for the Operation.

IV. The Patient being properly ſeated, with his Arm extended, and ſecured by an Aſſiſtant, you muſt then carefully ſearch out the true Seat and Courſe of the brachial Artery at the *Axilla*, in doing which you will be much aſſiſted by being previouſly verſed in the Anatomy of the Part. If the Tumor ſhould be ſo large as to prevent your Inveſtigation of the Artery, by feeling through the Integuments, you make a longitudinal Inciſion through them to the Bone, on each ſide the Arm, ſo that you may paſs your Fingers by the Bone, and diſcover What is to be firſt done in the Operation.

ver the Artery; which done, you muſt then paſs a large Needle[a] armed with ſix or eight Threads through the Fleſh within two Fingers breadth of the Cavity in the *Axilla*, ſo that the Needle may paſs through cloſe to the Bone, and betwixt that and the Artery, without injuring the latter. The Needle and Ligature being thus conveyed betwixt the *Os Humeri* and Artery, the Arm is now let down a little, to relax the Skin, and the Ligature is then tied with a Surgeon's Knot. Your next Buſineſs is to examine if there be any Pulſe in the Artery below the Ligature as it runs down the Arm, and, if ſo, your Ligature muſt be drawn tighter till you can perceive no Motion there; and then your Ligature muſt be ſecured from getting looſe, by a Knot or two more.

What is to be obſerved in the Operation.

V. There are three Things chiefly neceſſary for you to obſerve in the Operation, after the Artery has been thus ſecured by Ligature, to prevent a fatal Hæmorrhage: And theſe are 1. to leave Skin and Fleſh enough upon the Shoulder; 2. to cut through the muſcular Fleſh in the moſt convenient manner; and laſtly, 3. to divide the capſulary Ligament, which inveſts the Head of the Bone, and connects it to the *Scapula*, ſo that it may be taken out of the glenoeide Cavity in the latter, and be afterwards amputated entirely. To perform each of theſe Intentions with Succeſs and Dexterity, the Surgeon ought previouſly to make himſelf well acquainted with the Nature of the Articulation, with the Poſition of the *Proceſſus Acromion*, and to be careful that a ſufficient Quantity of Skin be preſerved and drawn back to wrap over the Wound; and, laſtly, to amputate with his Scalpel two or three Fingers breadth below the *Acromion*, ſo as to preſerve a large portion of the deltoeide Muſcle, which will not only fill up the Cavity of the Wound at the Shoulder, ſo as to render it uniform and even, but will alſo much expedite the Cure.

The manner of Amputating.

VI. Every thing being thus far conſidered and advanced, you now take the Scalpel, *Tab.* XIII. *Fig.* 1. or *Tab.* XII. *Fig.* 14. and therewith make your Inciſion through the Integuments, and through the deltoeide Muſcle, as near within the Joint as we before directed; which done, the Arm is then gently elevated, the better to diſcover and divide the Heads of the biceps Muſcle; and if, in performing this, you divide any conſiderable Arteries or Veins, which bleed ſo as to obſcure your Work, they may be ſtopped for the preſent, either by Compreſſure with the naked Fingers of an Aſſiſtant, or by the Application of Lint and Compreſſes. But if the Hæmorrhage is profuſe, and ariſes from a conſiderable Artery divided, as there frequently is a large Branch here, you muſt in that Caſe firſt ſecure it by Ligature before you proceed farther in your Operation. The next Step is to divide the Ligament of the Articulation firſt in its upper Part, and then on each Side, but very cautiouſly; moving the Head of the Humerus at the ſame time with your left Hand, that you may only divide the inveſting Ligament of the Articulation without injuring the Artery. Thus you may be ſenſible whether the Arteries are well ſecured; but even afterwards you muſt be very cautious not to wound the Artery, in dividing the reſt of the muſcular Fleſh beneath the Articulation. Laſtly, you muſt divide the Skin from the Arm near the *Axilla*, ſo as to leave a triangular Piece with its Corner outermoſt, and its Baſis next the Body, ſo as to be afterwards brought up over the Wound; and thus your Amputation is compleated.

[a] Le Dran uſes a ſtrait Needle; but Garengeot recommends a crooked one, like that to be ſeen in *Tab.* XIV. *Fig.* 10.

VII. The

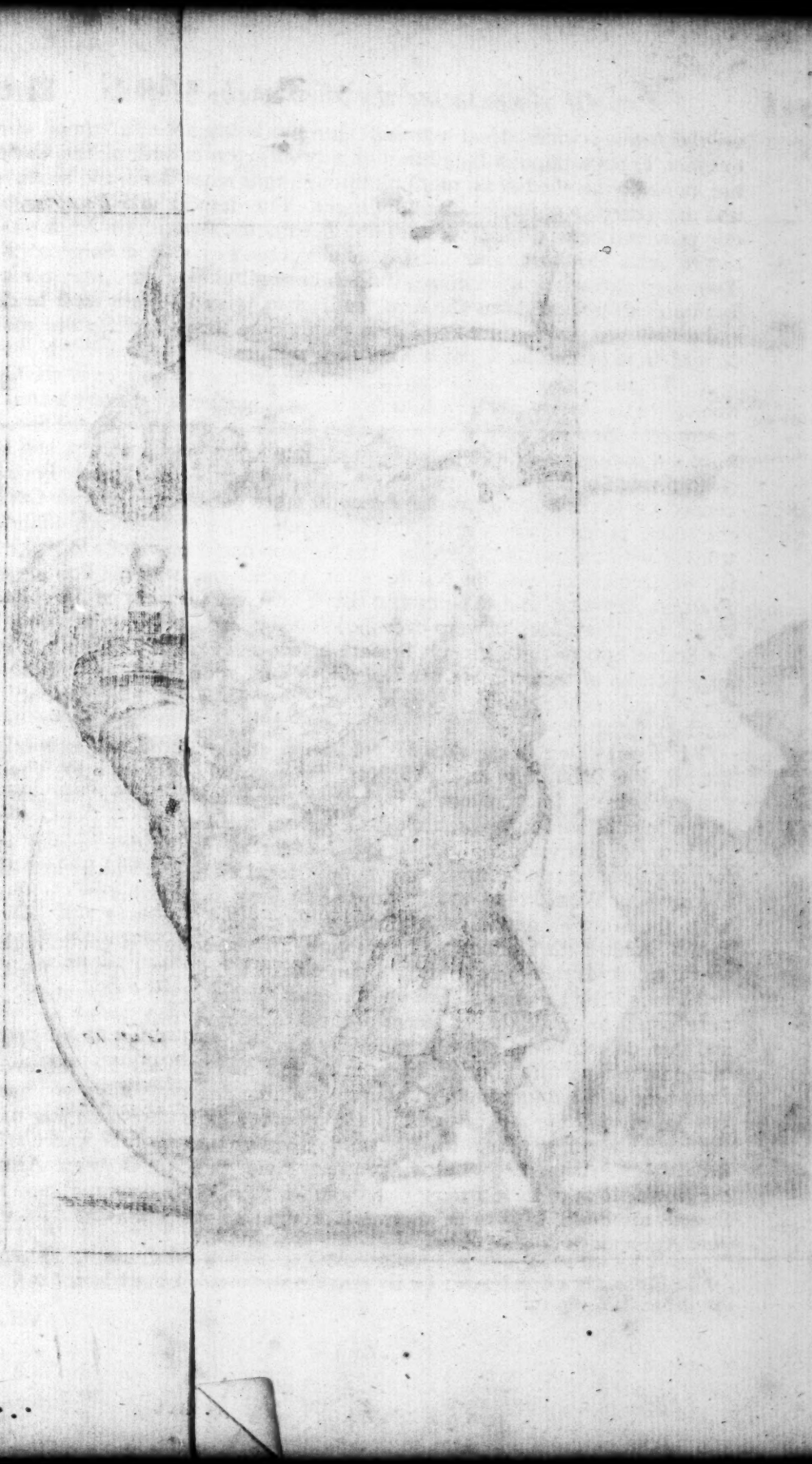

Plate 14.

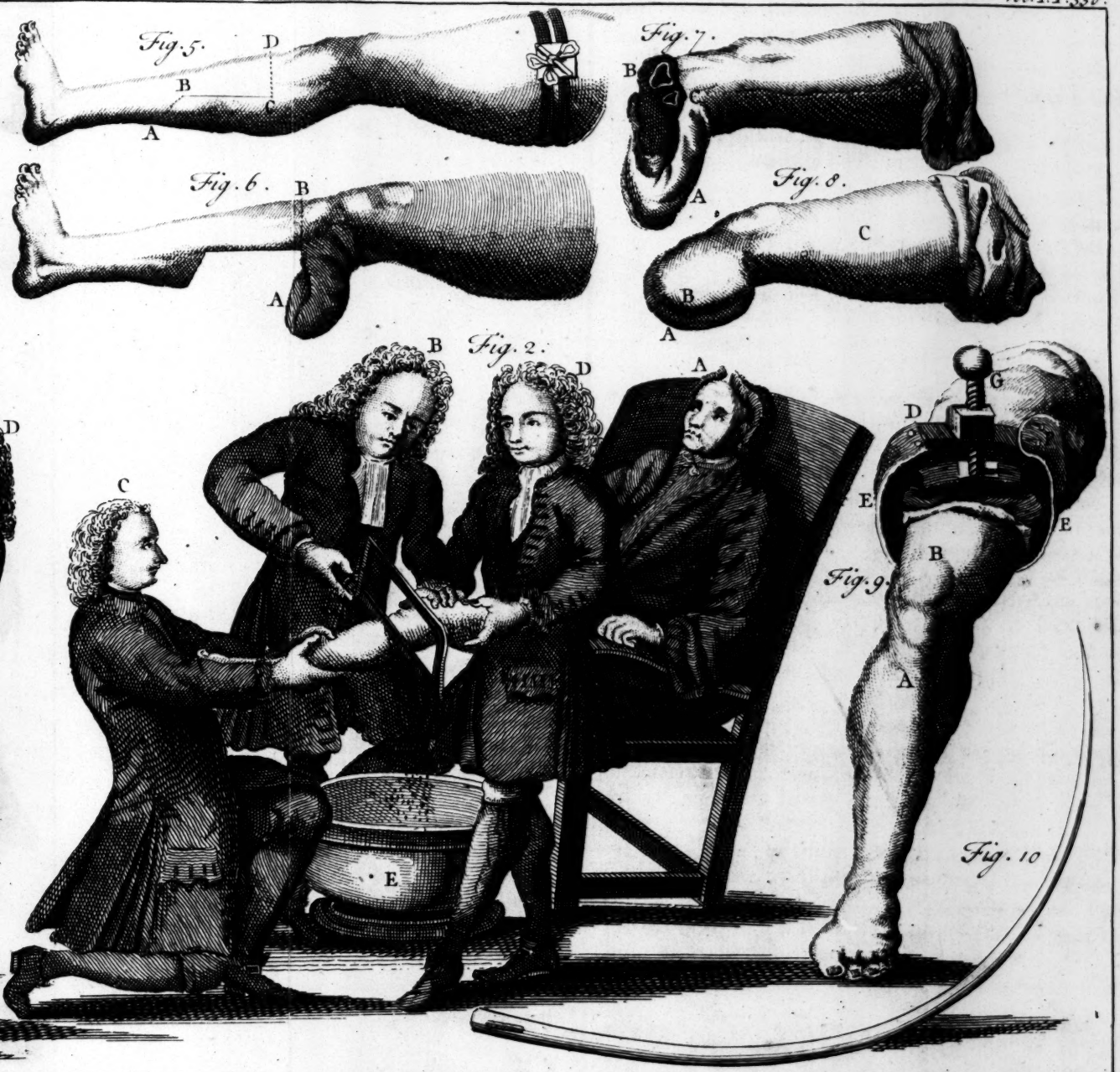
Fig. 5.
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Fig. 10

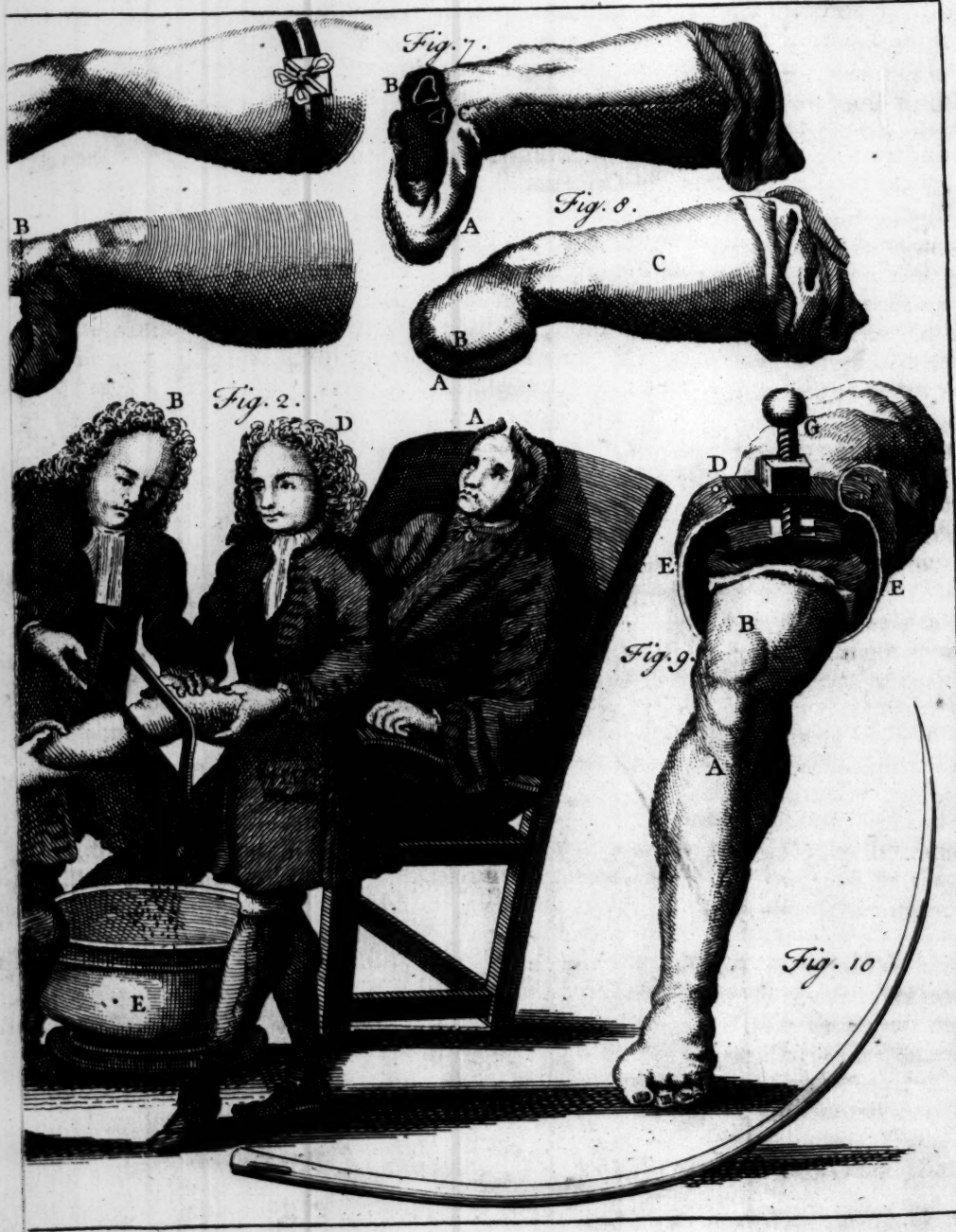
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Fig. 9.
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Fig. 10

VII. The Arm being totally removed in the manner now deſcribed, you muſt next ſearch for the Artery you before ſecured by Ligature, together with a portion of the Fleſh, and having diſcovered it, you now make another Ligature above the former upon the Veſſel only, by a ſmall crooked Needle, *Tab.* VI. *Fig.* 5. armed with ſtrong Thread, after which you remove the firſt Ligature from the Fleſh and Veſſel, to prevent it from exciting an Inflammation. What muſt be done after the Amputation.

VIII. You come now to the Dreſſings of the Stump, which muſt be made with a Pledgit of Lint with ſmall Linen-compreſſes upon the Ends of the divided Arteries you before ſecured by Ligature. The lower part of the Skin is then drawn upward, and the upper part is drawn down together with the piece of the Deltoeide-muſcle; and, in my Opinion, it would be better to apply no Pledgit or Compreſſes to the Arteries or Bone, before you have thus filled the *Sinus* of the Wound with the adjacent muſcular Fleſh, and brought the Skin well over, and then you may apply your Pledgit of Lint and Compreſſes; by which means the Fleſh will more readily unite, and the Wound heal ſooner than if you interpoſed Lint and Compreſſes. In the next Place, a large Quantity of Lint muſt be ſecured on the Wound by a ſticking Plaſter cut in the ſhape of a *Malta* Croſs, over which Plaſter you impoſe a large and thick Square-compreſs, with a cylindric Compreſs in the *Axilla*, to reſiſt againſt the Ends of the Arteries, that they may be better able to endure the *Impetus* of the Blood in their Pulſe. All theſe are to be again retained by a large double Compreſs in the Form of a *Malta* Croſs, and that again inveſted by two other Compreſſes a little more than a Foot long, and four Fingers breadth, one of which is applied obliquely over the Stump, ſo as to let one End come over to the ſound Shoulder, and the other End paſs behind to the ſound *Axilla*, or about a Hand's breadth lower; the other and longer Compreſs muſt be impoſed, ſo as to croſs the former in oppoſite Directions, and to have its Ends croſs each other upon the ſound Shoulder. Laſtly, your Deligation muſt be compleated with the Bandage termed *Spica deſcendens*, as we ſhall direct in the laſt Part of our Surgery. But, in making this Bandage, you muſt fix a thick Compreſs, or a ſmall Pillow, in the *Axilla*, that the Bandage may ſit the neater, and not compreſs the Veins too much which are there ſeated. Dreſſings and Deligation.

IX. The abovementioned Operation, as here deſcribed, was performed on a *French* Nobleman for a *Spina ventoſa*, in the upper Head of the *Humerus*, by Le Dran the elder, with the Conſent and Preſence of the moſt expert Surgeons in *Paris*, as M. Mareſcal, Arneau, Petit, Mery, *&c.* and this he did with Succeſs, the Patient being perfectly cured; as we are told by Le Dran his Son, and M. Garengeot. But the laſt of theſe Authors tells us, in a ſecond Edition of his Operations in Surgery, that the ſaid Nobleman died within ſix Months afterwards of a *Plethora*. M. Garengeot alſo directs this Operation to be performed for an Abſceſs in the Articulation; but whether it would be prudent to perform ſo dangerous and difficult an Operation, for a ſimple Abſceſs there, I leave to the Judgment of every experienced Surgeon. An Example of this Method of amputating.

An Explanation *of the* Fourteenth Plate.

Fig. 1. Shews the manner in which the Patient, Surgeon, and Aſſiſtants are to be placed for amputating the Hand, or Arm. A denotes the Patient, B the Sur-

Surgeon amputating with the Saw; C the Aſſiſtant extending the Hand; D another Aſſiſtant holding the Arm; E the Aſſiſtant who holds the Patient's Body, and takes care of the *Tourniquet*; F denotes the Diſh or Veſſel placed underneath, to receive the Blood.

Fig. 2. Repreſents the Poſition of the Patient, Surgeon, and his Aſſiſtants amputating the Leg. A denotes the Patient ſeated in a Chair, B the Surgeon, C the Aſſiſtant who holds the Foot below the Calf, D the Aſſiſtant who holds the Leg above the Knee, E a Veſſel placed on the Floor, to catch what little Blood may be ſpilt in the Operation.

Fig. 3. Denotes the moſt convenient Part for amputating the Leg at A, and the Thigh at B. But when the Diſorder has extended itſelf higher up in the Thigh, it muſt be amputated proportionably above this mark, though the Operation is then ſo much the more dangerous.

Fig. 4. Repreſents the Thigh A, with the Leg amputated B, in which may be ſeen the Part for fixing the *Tourniquet* C D, for amputating the Foot in the *Tarſus* or *Metatarſus*. The *Tourniquet* thus applied may alſo ſerve for amputating the Leg or Thigh, though not ſo conveniently as when placed higher up. In this Figure you have alſo a View of the divided Artery extended a little by the Pliers E, and going to be tied to the Ligature and Knot F. There are ſome indeed who do not approve of this manner of tying the Ligature; but I have often experienced that it thus anſwers very well.

Fig. 5. Deſcribes the manner of amputating the Leg, ſo as to preſerve the Calf, the Line A B denotes the firſt Inciſion to be made by the *Scalpel*, *Tab.* XIII. *Fig.* 1. or *Fig.* 3. The Line B C is the Courſe of the ſecond Inciſion, by which the Fleſh of the Calf is ſeparated from the Bones of the Leg; C D the place where the Bones and reſt of the Leg are amputated. Some reverſe this Courſe of Inciſion, and firſt perforate the Calf with a double-edged *Scalpel*, *Tab.* XIII. *Fig.* 3. in Line C, and then they direct the Knife in the Courſe B A; but the firſt method is, in my Opinion, moſt eligible.

Fig. 6. Repreſents the manner of reflecting back the Calf of the Leg towards the Ham, after it has been ſeparated from the Bones of the Leg by Inciſion; which done, the Surgeon next incides the Integuments, Fleſh, and *Perioſteum* in the Line B, and then ſaws off the Bones there.

Fig. 7. Denotes a Leg juſt amputated with the Calf A depending, to ſee the Ends of the two Bones, B the *Tibia*, and C the *Fibula*.

Fig. 8. Shews the Leg thus amputated, with the Calf A brought over and joined to the Stump B, C denotes part of the Thigh.

Fig. 9. Repreſents the manner of applying the Screw-*Tourniquet* (*Tab.* V. *Fig.* 6. or *Tab.* VI. *Fig.* 1.) above the Knee, C C the Preſs of the *Tourniquet* with its ſubjacent Pillow, D the place where the leathern or ſilken Strop E E is faſtened by Studs on one ſide, and by the Hooks F on the other ſide, G the Screw by turning which the ſubjacent Artery is compreſſed in the Ham.

Fig. 10. Is a large crooked Needle for making a Ligature on the brachial Artery before the Arm is amputated in its Articulation with the *Scapula*, though the ſame may be alſo performed by the ſtrait Needle, *Tab.* XVIII. either of which Needles will alſo ſerve for making Setons in the Neck.

PART

PART II. SECT. II.

Of Operations belonging to the Head.

CHAP. XXXVIII.

Of making Iſſues upon the Coronal Suture.

I. ISSUES are ſometimes made in the Scalp of the Head upon the meeting of the Coronal with the Sagittal Suture; but this Operation is not ſo frequent in *Germany*, as in *Italy* and *Holland*. Some Phyſicians think Iſſues in this part can be of little or no Service, being not able to diſcharge any Humours from the internal parts of the Head; and others again aſſert them to be of very great Efficacy, for the Truth of which they appeal to daily Experience. So that, if we may confide in Experience, and the Authorities of able Phyſicians, we muſt readily acknowledge that Iſſues, made in this part of the Head, may be highly ſerviceable in Vertigo's, obſtinate Head-achs, Apoplexies, Epilepſies, Amauroſis, Stupidity, or Forgetfulneſs, with many other Diſorders of the Head, and particularly of the Eyes and Ears, with Defluxions or Catarrhs. Their Uſes.

II. To aſcertain the proper Place of the Scalp for making theſe Iſſues, the ancient Phyſicians[a] direct to ſhave the Head, and then to meaſure with two Threads, one extending from the Noſe to the Neck, and the other a-croſs the firſt to each Ear; by which means the Point where the Threads touch, or croſs each other, will denote the Place where the Coronal and Sagittal Suture meet; and is therefore the fitteſt Place for making your Iſſue, as you may ſee in the Figures of SCULTETUS, *Tab.* XXXI. MEEKREN *Obſ.* Cap. V. and DEKKERS *Exercitat. Pract.* pag. 110. But, after all, it muſt be owned that this method of aſſigning the Place, or meeting of the Sutures, cannot be certainly relied upon, becauſe of the great Variation there is in this reſpect in different People; nor is it of any conſequence whether your Iſſue be made exactly over the meeting of the Sutures or not, ſince the matter diſcharged by it in both caſes, comes rather from the external Integuments of the *Cranium*, than through the Sutures from the Brain, as the Ancients falſly imagined. It was alſo a Notion equally wrong, that the Ancients entertained of this part of the *Cranium* being thinner, and more perſpirable, than the reſt; though it muſt be confeſſed, that Infants, whoſe Bones are not compleatly oſſified, have this part ſoft and membranous, which is uſually termed in them, the *Fontanel*, or open Mold; but, in Adults, this upper part of the *Cranium* is almoſt conſtantly oſſified like the reſt of the Skull, and frequently the Bones are even harder or thicker here than in other parts; yet theſe we find were the groundleſs reaſons which induced the An- The proper Seat of theſe Iſſues.

[a] See CELSUS *Lib.* VII. *Cap.* VII. N° 15.

cients

cients to make their Iſſues upon the meeting of the Sutures. But if the Surgeon will be ſcrupulouſly exact in this reſpect, he may pretty certainly diſcover the meeting of the Sutures, without the forementioned *Apparatus*, of meaſuring by Threads, if he well conſiders the courſe of them in dry Skulls, and feels carefully with his Finger upon the Scalp and Pericranium; for in moſt Patients the meeting of the Sutures is ſenſible to the Touch, either by a ſmall Cavity or Protuberance, upon either of which you may venture to make your Iſſue.

The Method of making Iſſues in the Scalp.

III. To render Iſſues in this Part more efficacious, they are uſually made by the actual Cautery; in order to which the upper part of the Scalp is firſt to be ſhaved, and then the red-hot Iron is to be ſtrongly preſſed by your Hand, ſo as to burn through the Integuments upon the part aſſigned, till you come to the Bones, or naked Cranium. The cauteriſing Iron for this Operation may be of two kinds, the firſt of which is without a caſe, as we have given you a Figure of it in *Tab.* III. *Fig.* 9. taken from MEEKREN and DEKKERS; the other, taken from AQUAPENDENS and SCULTETUS, is furniſhed with a Steel-caſe, or directing Tube, as we have repreſented it in *Tab.* XV. *Fig.* 1, and 2. But that the Force of the Cautery may not be extinguiſhed by the Integuments, before it has reached the Cranium, it may be convenient for the Surgeon, firſt to make an Inciſion either longitudinal [a] or cruciform through the Skin, and opening the Lips of the Wound, inſert the Tube at *Fig.* 2. that, by preſſing the Cautery, *Fig.* 1. through it, you may at the firſt time burn into the very Bone [b]. But in whatever manner you make the Iſſue in this Part, it muſt be immediately dreſſed afterwards with a Pea dipt in ſome digeſtive Ointment, to be retained by a ſquare Plaſter and the four-headed Bandage, applied as we ſhall direct in treating of Bandages. For the reſt, you may conſult what has been before ſaid of Iſſues in general at *Chap.* XIX. preceding. In order to credit the good Effects which many able Phyſicians affirm they have experienced from this ſort of Remedy, in many obſtinate Diſorders of the Head, it muſt be conſidered, that though there is no immediate Diſcharge hereby made of pernicious Humours from the Brain, yet the Cauteriſation makes ſo ſtrong a Revulſion, and the Pain it excites gives ſo ſtrong a Stimulus to the Veſſels, as frequently to remove Obſtructions, and the inveterate Pains they have occaſioned, even in one Inſtant. For more concerning the Uſes of Iſſues in this Part, the Reader may conſult, beſides the forementioned Authors, MARC. DONATUS, Lib. II. *Hiſt. Miral.* Cap. 4. M. A. SEVERINUS, *Pyrotech. Chirurg.* Lib. II. Part. I. Cap. 6. RIVERIUS, Cent. II. Obſ. 93. AQUAPENDENS, *Oper. Chirurg.* Cap. I. CLAUDINI *Reſponſ. de Cauterio in Suturâ Coronali*, &c.

[a] See CELSUS, *Lib.* VII. *Cap.* VII. N° 15.

[b] Thus MEEKREN, in his Figure, expreſſes an Inciſion before the Application of the Cautery; but ſays nothing of it in the Deſcription.

CHAP.

CHAP. XXXIX.

Of Arteriotomy in the Temples.

I. ARTERIOTOMY, as the Word imports, is the Apertion of an Artery with a ſharp Inſtrument, in order to extract a proper Quantity of Blood, for the Recovery of a Patient; performed almoſt in the ſame manner as bleeding in a Vein. Though this Operation is not ſo often performed at preſent with us, as it was formerly among the ancient Surgeons, for fear of the profuſe Bleeding, or an Aneuriſm, which may be occaſioned by wounding this Veſſel; yet, if it be well adapted to the Patient's Diſorder, and ſkilfully performed, it may be very often of the greateſt Service, and yet not attended with any bad Conſequences. We read of the Apertion of Arteries made by the ancient Phyſicians in various Parts of the Body; as in the Forehead, Temples, behind the Ears, in the *Occiput*, betwixt the Thumb and fore Finger, *&c.* wherever the ſmall Arteries lie fair for Inciſion, ſo that their Pulſation may be perceived by the Finger through the Skin; but among the modern Phyſicians and Surgeons we hardly ever meet with this Operation performed in any other Parts but the Temporal Arteries, which may be opened by the Lancet without much Difficulty or Danger, as they lie very near the Skin, ſo as generally to be very perceptible to the Eye or Touch, and, being reſiſted by the *Os frontis*, on which they are incumbent, they may be very eaſily compreſſed, ſo as to prevent any profuſe Hæmorrhage, or dangerous Aneuriſm; but even here every prudent Surgery muſt own, it is much more difficult to make a fair Apertion of an Artery, than of a Vein; becauſe they ſeldom appear viſible through the Skin, and then you have no other Guide but their Vibration on the Finger. We ſhall not here enlarge upon the extraordinary Artifices which we read to have been uſed for *Arteriotomy* by the ancient Surgeons, becauſe they are now obſolete; we ſhall, in this Place therefore, only deſcribe the Operation with its Dreſſings and Uſes, as they at preſent obtain among our modern Surgeons and Phyſicians. *Arteriotomy* deſcribed.

II. Firſt the Patient muſt be ſeated conveniently with his Head inclined to either Side againſt the Light, that the Surgeon may the better diſcover the Artery; in order to which he had beſt place the two foremoſt Fingers of his left Hand upon the Artery, at a little Diſtance from each other, as he will be directed by its Pulſation, and obſerving well the Courſe or Direction of it within that Space, to dip the End of the Lancet carefully into it betwixt his two Fingers. But it will be here neceſſary to inciſe deeper, as the Veſſel lies lower, than in *Phlebotomy*; you muſt alſo enlarge your Inciſion more, by elevating the Point of your Lancet as you draw it out; nor need you be afraid of cutting the Artery quite in two; for it will not be attended with any bad Conſequences after Compreſſure and Deligation. If now the Blood follows your Lancet in a very florid and ſalient Stream, ſtarting at every Pulſation of the Veſſel, you may be ſatisfied the Artery is well opened; otherwiſe you muſt repeat your Inciſion, till your Lancet has either divided or opened the Artery, which you may know by the fore-mentioned Signs. But as the ſmall and thin Point of the ordinary Lancet may be eaſily broke off againſt the Bone, I have experienced the *Scalpel*, The Method of Operating.

Tab. I. *Fig.* G. to be more convenient, especially if your Incision be downward and not upward. But to do the Patient any considerable Service by this Evacuation, you should bleed him plentifully; that is, to take about a Pound of Blood, or a Pound and half, or more, if he be plethoric, otherwise your Operation will be of little or no Benefit; and therefore we need the less wonder at the Practice of the Ancients, whose method was to bleed the Patient in this manner till he fainted. If you are desirous of opening an Artery in the *Occiput*, or behind the Ears, rather than in the Temples, your Operation may then be conducted in the manner we have now described.

Deligation. III. When a sufficient Quantity of Blood has been taken, your Deligation must be made with three square Compresses, each larger than the other, laying on the smallest first, in which must be included a Farthing, a bit of Lead, or a Pellet of chewed Paper, to compress the wounded Artery against the subjacent Bone. Your other two Compresses being laid over the smallest according to their Size, they must be there firmly retained and secured by the *Fascia nodosa*, which we shall describe at large when we come to treat of Bandages at the latter End of our Surgery. The Head thus properly invested with your Bandage, must continue so at least a Week or eight Days before you take it off, to prevent a profuse Bleeding, or an *Aneurism*; and if the Deligation should within that time get too loose, it must be tightened again, and continued till the Cure is compleated.

The Uses of *Arteriotomy*. IV. The Uses of *Arteriotomy* are so many and considerable, that not a few Physicians recommend it as the last Refuge in many Diseases of the Eyes, and the most obstinate Disorders in the Head, from whence the Patient will often find Relief when all other Means have been tried in vain, especially when they are caused by too great a Fulness of Blood. Experience can best testify the good Effects of *Arteriotomy* in Vertigo's, obstinate Head-achs, Epilepsies, Suffusions, and Inflammations of the Eyes, and most of the other plethoric Symptoms which attack these Parts; particularly in Apoplexies, it has been lately demonstrated in a professed Treatise on the Subject*, to be the most effectual and expeditious Method of relieving the Patient. I shall therefore leave the prudent Reader either to countenance or condemn the Opinion of those, who think *Arteriotomy too dangerous to be put in Practice, and even then of no more Use than Venesection*; since the Uses and Effects of it are attested by the Observations and Experience of our best Physicians, and the Danger of it may be totally removed by proper Compresses and Deligation; yet I must own, that, with regard to the Reputation and Character of a young Physician or Surgeon, it may be generally adviseable to defer this for the last Help, in Cases which will admit of Delay. After all it will be equally necessary to assist this, as well as many other Operations in Surgery, by ordering a proper Diet, Regimen, and Medicines adapted to the Patient's Disorder, if we expect to make any considerable Cure.

* By Catherwood, intituled, *A new Method of Curing Apoplexies*; notwithstanding which, the Operation has been twice performed by me on two apoplectic Patients, the one an old, and the other a young Man, but without the expected Success; for they both died soon after, though the Operation was made in the Beginning of the Disorder, and assisted with other proper Remedies; from whence we see, that *Arteriotomy* will not always cure Apoplexies.

CHAP.

CHAP. XL.

Of the Hydrocephalus.

I. HYDROCEPHALUS is a preternatural Diſtenſion of the Patient's Head to an uncommon Size by a Stagnation and Extravaſation of the Lymph; which, when collected within-ſide of the Bones of the *Cranium*, the *Hydrocephalus* is then termed internal, as it is *external*, when retained betwixt the common Integuments and the *Cranium*. The firſt kind of the Diſorder is ſeldom to be met with but in Infants, who contract it whilſt they are in the Womb, or in a difficult Birth. Among others the Reader may conſult on this Head, WEDELIUS *de Morb. Infant.* pag. 47. and RUYSCH *in Theſaur. Anat.* II. *Tab.* III. which laſt has given a very ample Account of this Diſorder; which generally appears in the Infant whilſt young and new-born, but if it has advanced to any great degree, it is a dangerous Caſe, and generally incurable. For if you make a *Paracenteſis* in the Head, to diſcharge the Lymph, your Operation is no ſooner performed, but the Infant dies, as Phyſicians have been too often well aſſured by Experience. If the Diſorder be in its firſt Stage, and but beginning to ſhew itſelf, it will be moſt adviſeable to try what may be done by Medicines; ſuch as gentle and repeated Purges, to draw the Humours downward with corroborating Medicines internally; while externally you may apply to a good purpoſe a large Compreſs round the Head dipt in warm *Aq. Calcis & Sp. Lavend. vel Aq. Reg. Hungar.* which Compreſs muſt be retained by a proper Bandage, termed the *Reflex Capeline*, which we deſcribed in the third Part of our Syſtem treating on Bandages. The internal *Hydrocephalus.*

II. In the external *Hydrocephalus*, as we obſerved, the Humours are lodged betwixt the external Integuments and the *Cranium*; ſo that you may diſtinguiſh this Species by the Softneſs of the Head and Skin externally; but in the internal *Hydrocephalus* the Head feels as hard as uſual, though it is much more diſtended and enlarged: The Reaſon of which Appearances is manifeſt from what we ſaid in the laſt Paragraph. Though the external *Hydrocephalus* is not without Danger, yet it may be much more readily cured than the internal Species, but the more difficultly as it is of a longer Standing. The Cure muſt be attempted as well by internal as external Remedies at the ſame time; ſuch as Cathartics, Diaphoretics, Diuretics, attenuating and ſtrengthening Medicines for internal Uſe; and externally you may apply a Compreſs dipt in the Fomentation before-mentioned for the internal *Hydrocephalus.* Or you may apply thoſe Waters and Spirits to the Head, together with diſcutient Caps or Bags filled with the tops of dry *Majorana, Origanum, Serpyllum, Pulegium, Chamomilla, Salvia, Roriſmarina, Lavendula, &c.* warming them before you ſecure them on the Head by the proper Bandage. HILDANUS writes, that he happily cured an *Hydrocephalus* barely with the repeated Application of *Aqua Calcis*, as a Fomentation by means of a Sponge. To the fore-mentioned Remedies we may add an Errhine, or cephalic Snuff, compoſed *ex ſummit. Majoranæ, Lil. conval. Mari veri, Hippocaſtan. Nicotianâ, &c.* Add to theſe the repeated chewing of Tobacco in the Mouth, to diſcharge the Seroſities from the Head by ſpitting. Laſtly, ſome foment the Head with the Fumes of burning Spirit of Wine highly rectified; but The external *Hydrocephalus.*

if all theſe Means prove unſucceſsful, Recourſe muſt then be had to Chirurgical Helps, among which you ought firſt to try a large Bliſter, applied behind the Ears, on the *Occiput* and Neck, and if this does not altogether anſwer your Intention, you may add Scarification and Cupping upon the ſame Parts. Piso relates, that he cured a Man of an *Hydrocephalus*, by making Iſſues in the Neck; and therefore Setons, one of which will effect as much as two Iſſues, may be here alſo highly ſerviceable. When all other Means have been uſed in vain, ſome of the Ancients adviſe a deep tranſverſe Inciſion to be made at the bottom of the Head or *Occiput*, which I cannot approve of, as it may eaſily wound, or even totally divide the Blood Veſſels and Muſcles there ſeated; but as this Danger may be avoided by deep Scarification and Cupping upon the ſame Parts, the Diſcharge that way may be equally ſerviceable, and much more commodious. The Parts ſcarified are to be afterwards dreſſed with Lint, ſpread with ſome digeſtive Ointment, adding ſometimes a little *Præcipitatum rubrum*, to keep up the Diſcharge; by which means, when the Diſorder is removed, you heal it up with ſome vulnerary Balſam, keeping the Patient, for a conſiderable time, in a courſe of proper internal Medicines, and under a ſuitable Diet and Regimen. Hiſtories of this Diſorder are given in Parey, Lusitanus, Kerkringius, and others, particularly Vesalius relates, that he found nine Pounds of Serum in the Ventricles of the Brain, in a Subject who died with an *Hydrocephalus*. Anat. Lib. 1. Cap. 5.

CHAP. XLI.

Of Trepanning the Cranium.

When the *Trepan* is neceſſary.

I. TREPANNING is univerſally underſtood to be a Perforating, or Opening, made in the Bones of the *Cranium* by a kind of *Terebra*, or round Saw, which has its Name from the *Greek* Word τρύω, and by the *Latins* called *Modiolus*. This Operation was performed by the Ancients, not only in Fractures and Depreſſions of the *Cranium*, but alſo in thoſe other obſtinate Diſorders of the Head and Brain, which could not be relieved by internal Medicines, and the Uſe of Iſſues upon the coronal Suture; by which means they thought to give a more immediate Vent to the offending Humours; but the modern Surgeons never uſe the Trepan at preſent for internal Diſorders of the Head, though they ſeldom neglect it in Fractures and Depreſſions of the *Cranium*, cauſed by Blows, Falls, Bullets, and other external Injuries. They alſo frequently apply it in Fractures and Fiſſures of the *Cranium*, to diſcharge extravaſated Humours, which by injuring the Brain, might occaſion the Death of the Patient. The Trepan is therefore uſeful, not only in theſe Caſes, to elevate the depreſſed Parts of a fractured Bone in the *Cranium*, for which you may conſult *Part* I. *Book* I. *Chap.* 14. but alſo the moſt fatal Symptoms, and Death itſelf, are avoided, by diſcharging the extravaſated Blood through an Aperture made by this Inſtrument. It is well known, that the Bones of the *Cranium* are often fiſſured, and the adjacent Blood Veſſels lacerated by external Injuries, without any apparent Fracture or Depreſſure of them; ſo that if the extravaſated Blood be not removed by the Trepan, by preſſing on the Brain it will greatly injure, if not totally deſtroy

its ſeveral Functions; and the Conſequences of neglecting this Inſtrument in ſuch Caſes will be Reſtleſneſs, Delirium, Convulſions, Vertigo, Apoplexies, Stupidity, with a Loſs of the Senſes, Speech, and voluntary Motion, and at laſt Death itſelf. Sometimes only the milder of theſe Symptoms appear, and in but ſmall degree, when the Head has been injured by external Violence; but in ſome time afterwards, when the Blood or Humours have been accumulated, the moſt fatal Symptoms do then gradually approach, and even threaten the Life of the Patient. But if Death is not the immediate Conſequence, as there is no natural Vent for the extravaſated Blood or Lymph, it muſt conſequently putrify, and, by corroding the Brain and its Membranes, will inevitably deſtroy the Patient in a little time, if Death be not timely prevented by a judicious Application of the Trepan, for diſcharging the offending Matter; which Inſtrument therefore ought never to be neglected in urgent Caſes of this Nature.

II. The leſs time you loſe, the better, before the Application of the Trepan; but in the Operation itſelf you muſt go on ſlowly and carefully. For it is extremely difficult, if not impoſſible, for you to take out a piece of the *Cranium* by this Inſtrument, without injuring the ſubjacent *Dura Mater*, to which it is moſt intimately attached, ſo as to be often in ſome degree wounded, though you uſe the greateſt Circumſpection. For this reaſon I am induced to condemn the Advice of thoſe [a], as very unſafe, who direct to trepan the *Cranium* immediately upon every ſlight Diſorder of it; I ſhould therefore adviſe you, with Celsus, and moſt of the Moderns [b], to try firſt the Uſe of other Remedies both external and internal, as *Phlebotomy*, Purging, Clyſters, diſcutient Bags, *&c.* rather than immediately to ſubject the Patient to the Trepan, before you are convinced it is abſolutely neceſſary. But you may ſee more upon this Head in *Part* I. *Book* I. *Cap.* 14. Sect. 36. *& ſeq.* where we treat of Wounds in the Head. On the other hand, there are many Caſes, in which Delay may be of the moſt fatal Conſequences, in which, being convinced of the Inſufficiency of other Remedies, you ought immediately to have Recourſe to the Trepan, in order to elevate or remove the depreſſed or fractured Parts of the *Cranium*, and to diſcharge the Humours extravaſated internally.

The Trepan not to be uſed haſtily.

III. The Surgeon can hardly ever be certain of the Succeſs of this Operation, becauſe he cannot be previouſly aſſured in what manner or degree the Brain, and its including Membranes are injured, the Diſorder generally turning out worſe than its Symptoms indicated; and therefore we need the leſs wonder that moſt Patients miſcarry after the Uſe of the Trepan, not from the Operation, but the violence of their Diſorder, or the Injury received. And ſome there are, who, being much better after the Operation, appear ſeemingly in a fair way for Recovery, and yet miſcarry beyond all Expectation. Upon Enquiry made after the Cauſes of this unexpected Diſappointment, and ſudden Death of the Patient, they appear chiefly to be two; either from, 1. an Inflammation or Suppuration of the Brain and its Membranes, from the Putrifaction of ſome Blood or Matter that could not be diſcovered or diſcharged; or, 2. from ſome Inſult of the Blood on the Parts affected, by Irregularities committed by the Patient in the

The Event of the Operation doubtful.

[a] See Fienus *de Trepanatione*, and Bohnius *de Trepanationis Difficultatibus*.

[b] Among which are Cæsar Magatus Lib. II. *de Vulneribus*, Cap. 41. and Dionis in *Chirurg. Operat.*——Celsus Lib. VIII. Cap. 4.

Non-

Non-naturals, either in drinking, and bad Diet, or by Frights, Anger, Venery, and other intenſe Paſſions, *&c.*

What Parts of the *Cranium* may be trepanned, and which not.

IV. But before we proceed to acquaint the young Surgeon with the Method of performing this Operation, it will be previouſly neceſſary to point out to him, upon which part of the *Cranium* it may be convenient for him to apply the Trepan. And, in general, the Place where the Fiſſure appears, will be moſt convenient for the Trepan, if nothing contra-indicates; but in Fractures it will be proper to trepan a little below the injured Part, that the extravaſated Humours may be more eaſily diſcharged, yet if the Fragments of the Bone can be removed, ſo as to make way for the Extraction of the Blood and Splinters which injure the Brain, the Uſe of the Trepan may be in that Caſe neglected. It muſt be next obſerved, that there are ſeveral Places in the *Cranium*, which ought not to be in any Caſe trepanned; ſuch as, 1. upon the Sutures where the Bones meet with each other, eſpecially upon the ſagittal Suture, as HIPPOCRATES has long before obſerved, becauſe in theſe Parts the *Dura Mater* is more ſtrongly attached to the *Cranium*, and under the ſagittal Suture runs the longitudinal *Sinus* of the *Dura Mater*, which, by trepanning in this Place, might eaſily be injured, to the Hazard of the Patient's Life; yet in Caſes of urgent Neceſſity, the Trepan may be uſed upon the coronal Suture, and ſometimes upon others: Inſtances of which may be ſeen in CARPUS. *Lib. de Fract. Cranii*, HILDANUS *Obſ.* 1. *Cent.* 2. 2. It is equally dangerous to trepan the *Cranium* in the middle of the *Os frontis*, eſpecially in that Part which forms the Fontanel, becauſe under theſe is ſeated the fore-mentioned *Sinus* of the *Dura Mater*, which might eaſily be wounded by the Inſtrument. 3. The Trepan muſt not be applied upon any of the *Sinuſes* of the *Os frontis*. 4. Nor ought it to be uſed where any large Vein or Artery ſpreads itſelf. 5. If the fractured part of the Bone, upon which you fix the Trepan, is looſe or *carious*, you might then injure the Brain by this Inſtrument. 6. It will be improper to trepan in the lower Parts or Baſis of the *Cranium*, which are inveſted with Muſcles, as about the *Occiput* and Temples, though the Moderns find, that the Trepan may be very well uſed, and even applied upon the lower Parts of the *Cranium*, and upon the Temporal Bones, after the Muſcles have been firſt freed from them. 7. Laſtly, it will be improper to trepan upon the cruciform Eminence of the *Os occipitale*. Notwithſtanding theſe Rules or Cautions, if a violent Fracture ſhould happen in or near the fore-mentioned Places, you ought to trepan as near to the affected Part as poſſible; and if the Fracture has paſſed a-croſs the Sutures, you muſt trepan within a Finger's Breadth of the Suture on each ſide. Sometime it is impoſſible to diſcover the particular Part of the *Cranium*, which is injured; the Patient, in the mean time, being afflicted with the moſt urgent and dangerous Symptoms, ſuch as Vomiting, Drowſineſs, Convulſions, Fever, Bleeding at the Noſe and Mouth, with the Loſs of his Senſes and Speech. In theſe Caſes it will be neceſſary to trepan firſt on the right Side, then on the left, afterwards upon the Forehead, and, laſtly, upon the *Occiput*, and ſo round till you meet with the Seat of the Diſorder; for it is much better, in theſe deſperate Caſes, to try a doubtful Remedy, than none at all, as CELSUS [a] rightly adviſes, that the

[a] In Lib. II. Cap. 10. To which we may add, the Sentence of HIPPOCRATES in *Aphor.* 6. Sect. I. *Deſperate Diſorders require deſperate Remedies.*

Sur-

Surgeon may not be accuſed of having neglected any thing which might conduce to the Recovery of the Patient. You muſt not think it a new or uncommon Practice to make ſeveral Perforations in the *Cranium* after one another by the Trepan; for in many Caſes we meet with extravaſated Blood or Splinters of the Bone, which require the Uſe of the Trepan in other Parts, beſides where the Wound itſelf manifeſtly appears; and therefore the Operation muſt be repeated, till you can diſcover and remove the Cauſe of the Diſorder: So that it is no wonder to meet with three or four, nay ſeven or twelve Perforations in the *Cranium* made by the Trepan in the ſame Patient, of which we are furniſhed with many Inſtances, particularly in SCULTETUS, *Obſ.* 7. GLANDORPIUS *Speculum Chirurg. Obſ.* 3. *pag.* 46. to which add DIONIS in his Operations, and many others; but what is more, we read of the Trepan being applied twenty-ſeven different times with Succeſs upon a Count of *Naſſau*, in STALPART. VANDER WIEL, *Cent.* 1. *Obſ.* 8.

V. After having pitched upon the Part to be trepanned, your next Buſineſs is to ſhave the Scalp, and make an Inciſion through the Integuments, to lay bare the *Cranium*, except it ſhould have been already done to your Hand by the Wound. The Inciſion of the Integuments may be made in the Form of a Croſs +, or in the Figure of the Letter X, V, or T, large enough to admit the Crown of the Trepan upon the Bone. After your Inciſion is thus made, you muſt elevate and ſeparate the Integuments and *Perioſteum* from the *Cranium*, by the Edge and Handle of the *Scalpel*; and having wiped off the Blood, you muſt inſert a large Quantity of ſcraped Lint, to dilate the Wound, and compreſs the divided Veſſels, in order to diminiſh the Hæmorrhage, which, though profuſe, may in many Patients be ſerviceable. A Compreſs muſt be next applied, dipped in *Sp. Vin. Aq. calc.* or *Sp. Vin. Camphorat. calid.* to be retained by the Kerchief Bandage: Thus the Patient is to be left, if the Diſorder will permit, for a few Hours, that the Blood may be ſtopped before you apply the Trepan; otherwiſe the Work will be ſo much obſcured, that you cannot ſee what you are about; yet if any Delay will be dangerous, you ought to apply the Inſtrument immediately; before which, if the Hæmorrhage be great, you may ſecure the Ends of the divided Arteries by Ligature with a crooked Needle and Thread: But if you are in great haſte, the Hæmorrhage may be ſuppreſſed for the preſent by the Fingers of an Aſſiſtant preſſed upon the Part. Proviſion for the Operation.

VI. We come now to the *Apparatus* of Inſtruments and Dreſſings, which muſt be provided before you enter upon the Operation; among which, the firſt and principal is the Trepan or Terebra, with its Crown, *Tab.* XV. *Fig.* 3. Some of the Ancients uſed a Trepan made in the Shape of a common Gimlet, according to the Figures of FABRICIUS *ab Aquapendente*, ANDREAS *a Cruce*, and SCULTETUS *(in Officinâ Chirurg.* pag. 14, *& ſeq.) Tab.* II. *Fig.* 7. *&c.* [a]; which Inſtrument they applied with one Hand; from whence it was uſually denominated the Hand-Trepan: But as this Inſtrument labours under many Defects, which render the Application of it leſs commodious, the Moderns, at preſent, uſe a Trepan like that repreſented in *Tab.* XV. *Fig.* 3. with a Handle turning round, like that uſed by Coopers, which is much more com- *Apparatus* of Inſtruments and Dreſſings.

[a] See alſo AMB. PAREY, *Lib.* IX. *Cap.* XVIII. where he gives ſuch a Figure of the Crown of this Inſtrument.

modious

modious than the ancient one, eſpecially if the Crown of it be made not cylindrical, but broader above than below, in the Shape of an inverted Cone, as it is repreſented in *Fig.* 3. A, by which means the Inſtrument, meeting with more Reſiſtance as it deſcends further through the Bone, is not ſo liable to ruſh in upon and wound the Brain. The Inſtrument contrived in this manner is by ſome termed the Trepan of HILDANUS, though it was known and deſcribed by CELSUS[b], and others of the Ancients long before HILDANUS. The Crown of this Inſtrument, marked A, is joined to the lower Part of the Handle B, by a Screw, ſo that it may be taken off and put on at Pleaſure; or elſe, that a Crown of another Size may be ſcrewed in its Place, ſince it will be neceſſary for the Surgeon to be provided with Crowns of different Sizes. The Connection of the Crown with its Handle is by ſome of our modern Surgeons made in a different manner from that here repreſented, but with no great Advantage, in my[c] Opinion, ſince that of the Make here repreſented, is found to anſwer moſt Purpoſes conveniently enough. The Trepan is diſtinguiſhed into Male and Female; in the firſt of which the Crown is furniſhed with a ſharp Point or Pyramid A; but when the ſaid Point or Pyramid, *Fig.* 4. is taken out by the Winch, *Fig.* 5. the Trepan is then termed Female. You muſt next be alſo provided with a *Scalpel* of a particular Make, with a round and flat Head, as repreſented at *Fig.* 6. which is by ſome denominated the lenticular *Scalpel*; to which add another Inſtrument for gradually depreſſing the *Dura Mater*, of the Shape repreſented at *Fig.* 7. You muſt be alſo provided with a perforating Inſtrument, *Fig.* 8. which muſt be ſcrewed into the Cavity B of the Handle *Fig.* 3; alſo a Hair-Bruſh, like that repreſented at *Fig.* 9. with a ſmaller Terebra or Wimble, like that in *Tab.* VII. *Fig.* 7. a Lancet, an Elevator, *Tab.* VII. *Fig.* 7, 8, and 14. a Tooth-pick made of a Quill, a Probe with a ſharp Point, ſome Doſſils of Lint; and, laſtly, a Veſſel with ſome *Spirit. Vin. rect.* all which are to be placed in order in a large Diſh or Plate, that they may be ready to the Surgeon's Hand in performing his Operation. The *Apparatus* of Dreſſings and Bandage to be applied after the Operation, conſiſts of a Doſſil of Lint of an orbicular Figure, which muſt be tied round the middle with a piece of Thread, about a Span long, the Form of which is repreſented in *Tab.* XV. *Fig.* 11. Beſides which, there muſt be added another round Bundle of Lint of a convenient Size, ſecured by a Thread like the preceding, as repreſented at *Fig.* 12. You muſt alſo have ſome Pledgits of Lint, *Fig.* 13. for covering the other Dreſſings, and filling up the Cavity in the *Cranium*. To theſe add ſome *Mel Roſar. & Tinct. Succin. vel Maſtich.* ſome ſcraped Lint, a ſquare Compreſs; and, laſtly, a large Napkin, or ſquare piece of Linen, to make the Kerchief or Bandage for the Head; all which Particulars are to be diſpoſed in Order upon one or two large Plates, that they may be readily found, and handed to the Surgeon as he wants them.

The Method of Trepanning.

VII. The *Apparatus* being thus provided, we come next to the Operation itſelf; to perform which with a greater Readineſs and Exactneſs, the Patient muſt be diſpoſed in a convenient Poſture upon a Couch, or ſome other low Seat, in ſuch a manner that the Surgeon and Aſſiſtants may have free Acceſs

[b] Lib. VIII. Cap. 3.
[c] *Vid.* GARENGEOT *Tract. de Inſtrument.* Tom. I. pag. 115.

to

to perform each their Part. This done, and the Dreſſings removed, the Wound is next to be cleanſed from the extravaſated Blood, or other Foulneſs; after which, you place the Head in a convenient manner upon a Pillow, to be held faſt by an Aſſiſtant. The Surgeon now takes the perforating Trepan, *Fig.* 8. which he adapts to the Handle B, inſtead of the Crown A, *Fig.* 3. ſo that by turning round the Handle D, he makes a ſmall Entrance or Aperture with his Inſtrument, and then applies the Male Trepan with a Crown, *Fig.* 3. A. Upon the Top of the Handle C C, the Surgeon fixes his left Hand, upon which he places his Chin or Forehead [a], while with his right Hand he ſlowly and carefully turns round the Handle, till the Crown of the Trepan, with its Spindle, have made a circular Entrance deep enough in the *Cranium*; and then he removes the Spindle, and continues his Work carefully with the Crown of the Trepan only, as long as he ſees convenient, all the Saw-duſt being firſt bruſhed off from the *Cranium* and the Teeth of his Inſtrument with Bruſhes of Hogs Briſtles: He now continues to uſe the Trepan till the Saw-duſt becomes bloody, which denotes that he has penetrated the *Diploë*, or intervening ſpongy Part of the *Cranium*; but it is to be obſerved, that he will not always meet with this Sign, becauſe in ſome Skulls the *Diploë* is wanting in the Part trepan'd: However, when the Saw-duſt becomes bloody, the Inſtrument muſt be directly laid aſide, and, after waſhing away the Blood with a Sponge dipt in *Sp. Vin.* he then ſcrews the ſmall Terebra, *Tab.* VII. *Fig.* 7. B, by two or three Turns into the ſmall Aperture in the middle of the trepan'd Piece of Bone, and then takes it out again, making two or three more Turns with the Crown of his Trepan; then he examines with a Probe or Toothpick, whether the Plates of the *Cranium* are ſufficiently ſawed through, which cannot be better known, than by carefully attending to the Colour of the circular Groove or Diviſion; for when that appears of a blue or grey Colour, when it was before white, it is a Sign that you have penetrated ſo far through the lower Plate of the Bone, as to render the *Dura Mater* almoſt conſpicuous through it. The Trepan muſt therefore now be applied with greater Circumſpection, leſt the Saw Teeth of its Crown ſhould ruſh in upon and wound the *Dura Mater*, which might be attended with violent Inflammation and the moſt malignant Symptoms; but if the bony Plate appears livid in one Part of the circular Groove, and white in another, it is a Sign that the Trepan has not cut equally through; and therefore it muſt be inclined and preſſed a little harder upon the whiteſt Parts, moving round the Handle ſlowly and carefully, till the Saw Teeth of the Crown have cut deep enough to make the round Piece of Bone looſe or moveable: In that Caſe it will not be convenient to cut totally through the Bone with the Saw Teeth of the Trepan. To avoid wounding the ſubjacent *Dura Mater*, you ſhould rather ſcrew in the Terebra again, *Tab.* VII. *Fig.* 7. B, or ſome ſuch Inſtrument, till you find that by pulling this upward with the Aſſiſtance of an Elevator, you can totally remove the round Piece of Bone.

[a] Moſt Surgeons formerly placed their Forehead upon their left Hand, on the Inſtrument; but it ſeems to be a better Practice to lean the Chin, as M. PETIT and GARENGEOT direct, becauſe then the Operator has a better View of his Work.

The Treatment after trepanning.

VIII. Having thus extracted the round Piece of the *Cranium*, the Blood uſually follows it; which being wiped off, the Surgeon is carefully to examine, whether there are any Fragments or rough Parts remaining to be extracted and looſened; for then you muſt ſmooth the rough Parts about the lower Margin of the Aperture, by applying the headed *Scalpel*, *Fig.* 6. to prevent the *Dura Mater* from being pricked and injured by any of the ſharp Splinters. This done, the Blood will more readily diſcharge itſelf; but to promote its Exit, you may gently incline the Patient's Head on one Side and another, tenderly and carefully preſſing the *Dura Mater* itſelf, either by the Head of the *Scalpel*, *Fig.* 6. or the Depreſſor, *Fig.* 7. by which means the Patient is no ſooner relieved from the Weight or Preſſure of the extravaſated Blood on his Brain, but he inſtantly begins to recover his loſt Senſes, either ſuddenly, or by degrees, like one juſt awoke out of a deep Sleep. When the Patient has thus recovered his Senſes, and the Blood notwithſtanding is in ſome meaſure retained, the Surgeon ſhould direct him to fetch a deep Breath, and hold it with a Strain, like one that has a hard Stool; others rather recommend violent ſneezing, provoked by Sternutatories, in order to force out the extravaſated Blood; the Succeſs of which, in my Opinion, muſt be very precarious, if not ſometimes fatal.

When extravaſated Blood, or a bony Fragment or Splinter are lodged under the *Dura Mater*.

IX. If the *Dura Mater* appears diſtended or elevated, and of a blackiſh blue Colour at the trepanned Aperture of the *Cranium*, it is uſually a Sign that Blood or Matter are retained underneath it; and therefore there remains but one and a doubtful Remedy for it, which is, to make a Perforation through the *Dura Mater* (as alſo the *Pia Mater* when the Matter lies ſo low) with a Lancet or *Scalpel*, to give vent to the retained Blood or Matter, which will otherwiſe certainly prove fatal to the Patient, by eroding ſome of the larger Blood Veſſels. I know there are ſome who think the *Dura* and *Pia Mater* cannot be perforated without deſtroying the Patient, and therefore they forbid it; but the Succeſs of this Practice, if you avoid the larger Arteries and Veins, is confirmed not only from my own Experience, but likewiſe the Authorities of [a] PAREY, [b] GLANDORP, [c] COITER, [d] FALLOPIUS, [e] MAGATUS, [f] MARCHETTI, [g] ROHAULT, [h] BLANCARD, and other creditable Writers, who teſtify that many have had this Operation performed without Danger. If you meet with any bony Fragments or Splinters which irritate and wound the Brain, they muſt be carefully extracted either by your Fingers or the Pliers; or if any Parts of the Bone are depreſſed only, you muſt raiſe them by your Fingers, a Lever, or an Elevator adapted to the Purpoſe. When a Splinter is inſinuated betwixt the *Dura Mater* and the *Cranium*, ſo that you cannot extract it by the firſt Aperture you made with the Trepan, a ſecond or third Perforation muſt be made by the ſame Inſtrument, till you have removed every thing injurious to the Brain and its Meninges. Sometimes it will be neceſſary to cut off or remove the bony Fragments, by making a ſecond Perforation into the firſt, like a half Moon, by the Trepan when the Fragments are ſtrong, or by the ſmall Saw, (*Tab.* VII. *Fig.* 9.) by a Pair of cutting *Forceps*, or laſtly by the Mallet and Chiſſel, to be ſeen in the ſaid *Tab.* VII. but when the Frag-

[a] Lib. 9. Cap. 21. [b] Obſ. Chirurg. 4. [c] Obſ. Anatom. & Chirurg. [d] De Vuln. Capit. Cap. 48. [e] De Vuln. Lib. 2. Cap. 42. [f] Obſ. 14. [g] Pag. 83. 116. [h] Obſ. Med. Phyſ. Cent. 1. Obſ. 27.

ments

ments are thin and weak, you may remove them by the lenticular *Scalpel*, *Tab.* XV. *Fig.* 6. that you may afterwards extract or remove the vellicating Splinters. When there is a long Fiſſure in the *Cranium*, you may trepan upon each End of it; but when the Fiſſure runs in ſeveral Directions, you muſt trepan upon each, becauſe every one of them has uſually extravaſated Blood or Matter lodged underneath.

Deligation and Dreſſings.

X. Having deſcribed the method of perforating the *Cranium* by the Trepan, and of diſcharging the extravaſated Blood, Matter, and bony Fragments, we next proceed to the Dreſſings and Deligation, which are made firſt with a round Pledgit of dry Lint, *Fig.* 11. to be laid next the *Dura Mater*, with a Thread faſtened to it, and hanging out of the Aperture, that it may be placed under and drawn out from beneath the *Cranium*; upon which Pledgit of Lint is afterwards poured ſome *Mel Roſar.* diluted with a little *Sp. Vini*; though there are ſome who recommend the Application of *Tinct. Maſtich. Succin. &c.* which are, in my Opinion, too ſtrong and acrid, becauſe they often moleſt the Patient with violent Pain. You then impoſe a like Pledgit of Lint, furniſhed with a String, as in *Fig.* 12. with other Doſſils, till the Cavity is replete; and, in the next place, the *Cranium* and Wound itſelf muſt be dreſſed with Lint, ſpread with ſome mild digeſtive Ointment, or *Mel Roſar.* upon which add a ſquare Compreſs, dipt in warm *Sp. Vini*, or *Sp. Vini Camphorat. cum Aq. Calc.* and then you ſecure the whole, without a Plaſter, by the Capeline or Head-Bandage, deſcribed in the End of our Surgery.

Of renewing the Dreſſings.

XI. In the ſubſequent Dreſſings, which muſt be repeated once or twice every Day, you muſt ſtrictly avoid fat and oily Applications; which will deſtroy the Membranes and foul the Bones; inſtead of ſuch, you muſt apply balſamic and healing Topics, eſpecially *Mel Roſar. cum pauco Sp. Vini*, *Tinct. Maſtich. &c.* The Wound being thus conſtantly dreſſed and attended, you will have an Exfoliation of a thin Plate from the trepanned Margin of the Bones, uſually within forty or fifty Days, which ought not to be pulled away by Force. Your Exfoliation being obtained, there will then appear new Fleſh and *Callus*, ſhooting up from the clean Bone and *Dura Mater*, ſo as at length to fill up the whole Cavity. By that time you find the Cavity about half filled, you muſt moderately compreſs the ſprouting Fleſh and *Callus* by ſcraped Lint and Bandage, to prevent it from being too ſoft and lax; and when it is arrived even with the Surface of the Bones of the *Cranium*, you muſt endeavour to conjoin and extend the Integuments over it, by the Aſſiſtance of Sticking-Plaſters, that the new-formed Subſtance may intimately unite with the ſuperinduced Skin. This new-formed Subſtance, with which the Cavity in the *Cranium* is filled, becomes gradually more and more indurated, but ſo as even at laſt to reſemble rather a Cartilage than a Bone, which, upon boiling the *Cranium*, ſeparates, and falls out from the other Bones. And it is from the weaker Reſiſtance of theſe cartilaginous Places, that ſuch as have been trepanned are ſubject to Diſorders and Pains in their Heads, upon a Change made in the Weight and Temper of the Atmoſphere; though that Inconvenience may be partly remedied, by conſtantly keeping the Place armed with a Plate of Silver.

The Removal of Accidents.

XII. If a Vein ſhould open itſelf ſo as to bleed profuſely after the Operation has been performed with the Trepan, then you muſt ſprinkle on ſome *Pulv. ex bolo armenâ, Sang. Dracon. Thure & Colophon. &c.* compreſſing the Part for ſome time with Lint. But if the Brain or *Dura Mater* ſhould be inflamed, you muſt apply diſcutient and cooling Topics externally, *Aq. Flor. Samb. cum pauc. Gutt. Sp. Nitri dulc.* the Patient muſt alſo uſe Abſtinence, with *Phlebotomy*, and cooling diluent Medicines internally: Even ſome (as ROHAULT, *p.* 123.) recommend Scarification of the *Dura Mater* itſelf, before the laſt preſcribed mixture is applied. But if a Suppuration ſhould follow, ſo as actually to form an Exulceration, the Surgeon muſt cleanſe away the Matter, or *Sordes*, with ſcraped Lint, or by an Injection mixed with *Sp. Vini & Tinct. Maſtich. Succin. vel Elix. Prop. ſine alcali vel acido.* If, after the Patient has been once trepanned, he perceives great Uneaſineſs and Diſorder in ſome other Part of the Head, it is a Sign there ſtill remains ſome foreign Body to be removed; and therefore the Trepan muſt be again applied upon the aſſigned Place. If any ſpongy Excreſcence, or proud Fleſh, ſhould riſe up above the Level of the Wound upon the *Cranium*, it muſt be removed by ſome of the following methods, either by ſtrong Depreſſion with Lint dipt in *Sp. Vini vel Tinct. Maſtich.* and a tight Bandage, or by applying the round Piece of Lead, *Fig.* 14. contrived by BELLOST, and is by ſome made perforated, and furniſhed with Handles, as at *Fig.* 15. which is to be put into the Aperture of the *Cranium*, and well covered with round Pledgits of Lint; but you will ſeldom have occaſion for this Inſtrument, if the firſt method be uſed. Or, laſtly, if the Excreſcence has already ſurmounted the Surface of the *Cranium*, it may be cut off either by tying it round with a Thread, or with a Pair of Sciſſors, and the reſt may be taken down with *Vitriol. cærul. Pulv. Sabin. vel Alum. uſt.* and for the future you muſt make a ſtricter Compreſſure and Deligation with more compact Doſſils of Lint; by which means the ſprouting Excreſcence will be not only compreſſed and reduced, but the Wound itſelf will readily heal in a little time.

CHAP. XVIII.

Of extracting Bodies fallen into the Eyes.

Things to be extracted from the Eyes.

I. IT is no uncommon thing for the Eyes to be moleſted with a Bit of Glaſs or Sand, a Splinter of Wood, or from off a Quill, or the Toe or Finger-Nails, and ſometimes by little Inſects, or cauſtic and pricking Bodies of various kinds, which, by ſlipping into this tender Organ, we daily experience will produce excruciating Pain and Inflammation; to remove which, and prevent their bad Conſequences, the Surgeon's Aid is often required, whoſe chief Buſineſs is to diſcharge the foreign Body as ſoon as poſſible, by ſome of the means we ſhall hereafter preſcribe.

II. The

II. The firſt and moſt eaſy method of diſcharging theſe Subſtances is, by agitating and extending the Eyelid with one's Fingers, holding the Head down at the ſame time; by which means the increaſed Flux of Tears, excited by the vellicating Body, very often waſhes the ſame out of the Eye, without much Difficulty. But if this method does not ſucceed, the next Remedy is to blow ſome levigated Pearl or Crabs-claws though a Quill under the Eyelid, that, as theſe are waſhed out by the Tears, they may alſo take away the foreign Body with them; otherwiſe the Surgeon muſt take the ſmall round Head of a ſlender Probe, or a little Pair of Pliers, the End of a Tooth-pick, *&c.* and extending the Eyelids gently from the Eye, carefully ſearch for, and tenderly extract the offending Body. There ſtill remains a very eaſy and certain method for removing theſe injurious Subſtances from the Eyes, which is by dipping a Pencil-bruſh of ſoft Feathers, or a bit of fine Sponge faſtened in a Quill, in warm Water, by which you may bruſh them out from betwixt the Eye and its Lid. Lime, or any acrid Salt, and ſuch like Subſtances, may be waſhed out by warm Water, or Milk, either by injecting them, or with a Feather or bit of Sponge. When the foreign Body is removed, the Surgeon muſt furniſh his Patient with a cooling anodyne Collyrium *ex Aq. Roſar. Damaſc. cum albumine ovi conquaſſatâ, & pauxillo Sacchar. Saturni, vel Lap. Tutiæ præparat.* with which the Eye is to be frequently waſhed, not neglecting to bleed the Patient at the ſame time, if there be any conſiderable Inflammation. Methods of Expulſion.

CHAP. XLIII.

Of Tubercles and Excreſcences on the Eyelids.

I. THE preternatural Tubercles, which we frequently meet with upon the Eyelids, are of various Sorts and Sizes. If the Tubercle be ſmall, hard, red, immoveable, and ſeated upon the Eyelid above the *Cilia*, or Range of Hairs, it is then denominated by the *Greeks*, *Crithe*, and by the *Latins*, *Hordeolum*, from its ſuppoſed Reſemblance to a Barley-corn. This Tumor is included in a kind of Cyſt, which, by Inflammation, degenerates into a thickiſh Matter, from whence frequently proceed intenſe Pains and various other Diſorders of the Sight. The Seat of the *Hordeolum* varies, being ſometimes immediately next to the Skin, and ſometimes within-ſide the Eyelid, under its Muſcle. When the Tubercle is moveable, 'tis uſually denominated *Chalazium*, or a Stithe; ſome are termed *Grandines*, as being like Hail, others are named *Hydatides*, being Veſicles replete with watery Humour. Sometimes ſeveral Species of the Encyſted Tumors are formed upon the Eyelids, as the *Atheroma*, *Steatoma*, and *Meliceris*; of which we have already treated in *Chap.* XXVIII. preceding. It may be here obſerved once for all, that almoſt all the Tubercles on the Eyelids are of the encyſted kind, ſome having a ſmall depending Baſis, and others a broad one, as may be ſeen in *Tab.* XV. *Fig.* 16, 17, 18. Kinds.

II. We are, from the Importance and Obviouſneſs of this Organ, obliged to undertake the Cure and Removal of many of theſe Tubercles, which, in other Parts of the Body, might be very well neglected; yet we ought not, even here, to call in the Aſſiſtance of the Knife, when they are very ſmall, and not troubleſome Prognoſis.

bleſome to the Sight; for they are often tolerable without Danger, though they may perhaps give a little Deformity. 'Tis remarkable, that theſe Tubercles ſeldom give way to topical Remedies, nor ſhould you be over forward with the Uſe of emollient Cataplaſms, which are recommended by ſome, becauſe the Eye itſelf may be injured by them, and therefore Extirpation is to be preferred.

Cure. III. Almoſt all Tubercles of the Eyelids, which do not hang pendulous by a ſmall Root, are removed by making an Inciſion through the Integuments by the *Scalpel*, ſo as to avoid wounding the Tumor, in order to take it clean out, as we before directed for Encyſted Tumors in *Chap.* XXVIII. foregoing. But if the Coats of the Tumor are wounded, or adhere very firmly to the adjacent Fleſh, ſo that it cannot well be extirpated whole by the *Scalpel*, it may be cut out as far as you well can by a Pair of ſmall Sciſſors, and the Remainder eroded and caſt off by dreſſing with *Ægyptiacum*, or ſome other digeſtive Ointment, mixed with *Præcipitat. rub. vel Lap. infernal.* after which you may compleat the Cure with Balſams, as in other Wounds. In ſome Caſes, when I think the Tumor cannot be totally extirpated, I make an Inciſion through its including Cyſt, together with the common Integuments, and, after expelling or diſcharging its Contents, deſtroy the reſt with Digeſtives and Cauſtics, as I directed for Encyſted Tumors. But here you muſt be very careful to prevent any of the Cauſtic from falling into the Eye, which might greatly injure, if not deſtroy its Sight. But we are furniſhed with a much more ready and eaſy way of removing thoſe Tubercles of the Eyelids, which hang pendulous by a ſmall Root, as at *Fig.* 17, *and* 18. which is, either to cut them off inſtantly by a Pair of Sciſſors, or elſe gradually by a Ligature with a Silk-thread; but another method muſt be taken with the *Hordeolum*, becauſe that, contrary to moſt Encyſted Tumors, is uſually attended with Pain and Inflammation; and therefore in theſe laſt it will be proper firſt to try to diſperſe them by diſcutient Applications; and, if that will not ſucceed, to bring them to Suppuration before they are inciſed. It will greatly conduce to diſperſe and eaſe the Pain of an incipient *Hordeolum*, if the Patient frequently foments it with his faſting Saliva, or elſe with a Mucilage *ex Sem. Cydoneor.* or the Pulp of a roaſted Apple mixed with a little Saffron and Camphire. If none of theſe ſucceed, but the Tumor holds on its Inflammation, and begins to turn yellow, you may ripen and break it with a *Diachylon* Plaſter, or a mixture of Honey and Meal; but the Cure of it will be ſooner compleated, if you invert the Eyelid, by Inciſion with a *Scalpel* a-croſs the Tumor, ſo as to ſeparate the Skin of the Eyelid, and extract the Cyſt entire, if it be hard, otherwiſe you may open the Cyſt, and diſcharge its included Matter, and deſtroy the Remainder by Digeſtives; by which means you will avoid an unſightly Scar in the Eyelid, and the Wound itſelf will heal without the Application of other Medicines.

CHAP.

CHAP. XLIV.

Of Warts on the Eyelids.

THE Eyelids are frequently moleſted as well with Warts as the foremen-tioned Tumors, which often both obſtruct the Sight, and diſfigure the Eye, for which Reaſons the Patient is deſirous of their Removal. Theſe Warts adhere to the Eyelids, either by a broad or ſlender Baſis, and may be extirpated either by the Knife, Ligature, or Cauſtics, in the manner we directed for Warts in general, in *Chap.* XXVI. preceding. You muſt never apply the actual Cautery to deſtroy theſe Warts, as you may for thoſe in other Parts of the Body; nor ſhould you apply Cauſtics but with the greateſt Circumſpection, leſt if any Part ſhould ſlip into the Eye, it might greatly injure, or deſtroy the Patient's Sight [a]. If a Wart on the Eyelid appears blackiſh, or livid, you will generally have Reaſon to fear its turning cancerous, as it will do, eſpecially if irritated with Inſtruments or Medicines, for which Reaſon theſe are uſually termed, *noli me tangere*, by the moſt expert Oculiſts; ſo that it is beſt to leave this Species of Warts to themſelves. I happily removed a large Wart from the upper Eyelid by Ligature, which had no broad Root, but impeded the opening of the Eyelids; the Figure of which Wart you may ſee in *Tab.* XV. *Fig.* 17. A.

CHAP. XLV.

Of Relaxation and Tumor of the Eyelids, termed Phalangoſis *and* Ptoſis.

I. WE frequently meet with the Eyelids either tumified, or relaxed to ſuch a degree, as greatly deforms the Eye, and impedes its Viſion. Sometimes the relaxed Eyelid ſubſides in the manner repreſented by *Fig.* 19. *Tab.* XV. occaſioned either from a Palſy of the Muſcles, which ſuſtain and elevate the Eyelids, or from a Relaxation of the *Cutis* above, from various Cauſes. Sometimes an œdematous or aqueous Tumor is formed on the Eyelids, ſo as almoſt entirely to exclude Viſion, which Caſe ſhould be well diſtinguiſhed from the former, and may be remedied, without much Difficulty, by the Uſe of internal and topical Medicines; ſuch as Purges with Diuretics and Sudorifics inwardly, and a Compreſs dipped in warm *Sp. Vin. Camph. & Aq. Calc.* but in the paralytic or relaxed Caſe, after the Uſe of nervous and cardiac Medicines, you may apply a little *Balſ. Peruv. cum Aq. Reg. Hungar.* &c. and if theſe Medicines do all of them miſcarry, the beſt and moſt expeditious method is to extirpate a ſufficient Quantity of the relaxed *Cutis*, and, after healing up the Wound, the Remainder may become ſufficiently ſhortened.

Nature of the Diſorder.

[a] Thus TIMÆUS à GULDENKLE *Lib.* I. *de Affect. Capit. Cap.* XXI. relates the Caſe of a Surgeon, who blinded a Woman by endeavouring to remove a Wart from her Eyelid by the cauſtic Juice of Spurge.

II. The

The ancient method of Cure.

II. The Ancients contracted the Skin thus relaxed, by extirpating Part of it with the Aſſiſtance of a Ligature with a Needle and Thread; having firſt carefully ſecured it by Ligature, and by paſſing the Needle through the bottom of the Skin, they then cut it off cloſe to the Ligature, which, in many Caſes ſucceeded very well. Sometimes they firſt amputated Part of the relaxed Skin by the Sciſſors or *Scalpel*, and then ſecured the Wound, either by Ligature or Suture, with a Needle and Thread, as we read in HIPPOCRATES, (*Lib. de Vict. acut. Sect.* LXVI.) CELSUS (*Lib.* VII. *Cap.* 7. N° 8.) and PAULUS ÆGINETA *Lib.* VI. *Cap.* 8. But the Hæmorrhage frequently proves ſo large in this laſt method, as to obſcure the Wound, and render it impoſſible to make a neat Sature, or Ligature; to avoid which Inconvenience, the famous *German* Oculiſt BARTISCHIUS, formerly contrived a wooden Inſtrument, *Tab.* XV. *Fig.* 19. B B. to intercept the redundant Part of the *Cutis*, and, compreſſing it by turning the Screw D D, ſo as to obſtruct the Blood Veſſels, and hinder the Circulation, the intercepted Part mortified in a few Days time, and caſt itſelf off.

The modern Treatment.

III. But as the laſt-mentioned Practice of BARTISCHIUS was attended with great Pain, Inflammation, and other Inconveniences, VERDUYN has much improved upon him, by making almoſt a ſimilar Inſtrument of Braſs, but with Perforations in its upper and lower Plates, as in *Tab.* XV. *Fig.* 21. By which Inſtrument the redundant *Cutis* is not only compreſſed, but alſo ſecured with a Ligature, by paſſing a Needle and Thread through the Apertures, and leaving about four or five Inches of the Thread hanging down on each Side, you then amputate the redundant Skin, cloſe to the Edge of the Inſtrument, with a *Scalpel*, or Pair of Sciſſors, after which you remove the Inſtrument, and make a Ligature with the Threads. After having performed your Operation, the Wound is, for the firſt time, to be dreſſed with ſome vulnerary Balſam and ſcraped Lint; but, in the ſubſequent Dreſſings, you may ſpread your Lint with ſome digeſtive Ointment, to be retained with Compreſs and Bandage, as we directed in other Wounds of this Part. After a few Days, when the Lips of the Wound appear to be pretty well cloſed or conjoined, you may then cut the Ligature, and carefully extract the Threads, removing them, not all at once, but one at a time, in each Dreſſing, compleating the Cure with ſome vulnerary Balſam and Emplaſter. You may cauteriſe the Wound before the removal of the Inſtrument, which will not only ſuppreſs the Hæmorrhage, and render the Diſorder leſs liable to return again, but may perhaps at the ſame time, ſave you the Trouble of making a Ligature or Suture. Sometimes this Diſorder is ſo great, as to deſtroy the Figure of the Eye, or ſo obſtinate and inveterate as to return again, after a repeated Performance of the Operation, which renders the Caſe incurable. Laſtly, we may obſerve, that RAW invented an Inſtrument, not much differing from the former in its make and uſes; (See *Fig.* 22.) but you may ſee the original Invention of this Inſtrument highly controverted between him and RUYSCH[a], who rather attributes it to ADRIANSONIUS.

[a] See RUYSCH *Epiſt. Anat.* XIII. and RAVIUS in *Tract. de Septo Scroti.*

CHAP.

CHAP. XLVI.

Of the Trichiaſis, *or Inverſion of the* Eyelids; *in which the Hairs irritate the Eyes.*

I. THE *Cilia*, or Margins of the Eyelids are ſometimes inverted, ſo as greatly to irritate the ſenſible Coats of the Eye, and bring on intenſe Pains and Inflammation, which, without timely Aſſiſtance, may greatly injure, if not totally deſtroy the Sight. This Diſorder is, by the *Greeks*, termed *Trichiaſis*, *hairy*; and ſometimes *Entropion*, *Inverſion*, becauſe herein the Lids and their *Cilia*, or Hairs, are inverted, ſo as to offend the Eye. The Diſorder is generally occaſioned from an irregular Cicatrix formed from a Burn, the Small-Pox, an Ulceration, or Wound from ſome external Injury. Sometimes a Relaxation of the Skin, and a paralytic Diſorder of the Eyelids, deſcribed in the preceding Chapter, make one of the chief Cauſes of a *Trichiaſis*. Nor is the Cure of a *Trichiaſis* to be effected without much Difficulty, eſpecially when the Diſorder is become inveterate. Cauſe of the Diſorder.

II. 'Tis hardly poſſible for the Surgeon to remove this Diſorder, ſo as to prevent its returning, without extirpating the offending Hairs, which every one muſt allow to be no eaſy Operation, that has ſeen any thing of the Diſorder. For if you cut the Hairs cloſe off, it will be to no purpoſe, becauſe the rigid and ſharp-pointed Stumps of the Hairs will ſhoot up, and irritate the Eye worſe, than the Hairs did before. Some indeed endeavour to cure the Diſorder, without extirpating the Hairs, by clearing them out from the Eye, and keeping them folded back, or paſted on the out-ſide of the upper and lower Eyelids by ſome ſticking Plaſter; but this Practice is not often attended with the deſired Effect, becauſe the motion of the Eyelids looſens the Hairs, and they become again inverted, ſo as to offend the Eyes, as before. In this Caſe therefore the Practice of ſome is conformable to the Advice of CELSUS (*Lib.* VII. *Cap.* VII. N° 8.) who directs to burn out the Roots of the Hairs one by one, with a ſlender, but broad-pointed Needle of Steel, in the Shape of a *Spatula*, heated red-hot; but ÆGINETA (*Lib.* VI. *Cap.* 13.) directs to extract each Hair firſt with a pair of Pliers, before the Cauteriſation of their Roots; which is an Operation ſo painful, that the Patient will hardly ſubmit to it; and therefore ſome chuſe to fill up the Cavities at the Roots of the Hairs, after their Extraction with *Lap. infernal.* or ſome other Cauſtic, taking great Care that no Part of it ſlips into the Eye; or it will be better to touch their Cavities with a ſmall Pencil-bruſh dipt in *Spir. Salis Ammoniaci cum Sp. Vini rectificatiſſ.* by which means they will cicatrize and cloſe up, without producing any more Hairs. When there are many injurious Hairs to be thus extracted, it will be better to remove them at ſeveral times, than all at once; otherwiſe you may induce too great Pain and Inflammation on the Eye, whoſe *Cornea* ſhould be alſo defended from the Cauſtic or Cautery here uſed by a ſmooth hollow Plate of Lead, Wax, or Horn, adapted in the ſame manner as for artificial Eyes. If the Diſorder ſhould ariſe from a Relaxation of the Eyelids, it will be neceſſary to treat it in the ſame manner we directed in the preceding Chapter. Method of Cure.

Other Methods.

III. But if all the Hairs of the Eyelids are thus inverted, and the Patient will not permit them to be extracted by the Roots, and to be afterwards treated with Cauſtics; there then remains but one, and a lamentable Method of removing the Diſorder, by amputating the *Cilia*, or cartilaginous Margins of the Eyelids themſelves, which the Patient had better ſubmit to, notwithſtanding the Deformity it may occaſion, rather than be blind. After the Operation, a *Collyrium* ſhould be made, and applied *ex Aq. Roſar. alb. Ovor. & pauc. Sacchari Saturni*, and the Wound muſt be treated in the ſubſequent Dreſſings with ſome Balſam, till it be healed. But lately CORTUMIUS, in a profeſſed Diſſertation *de Trichiaſi*, under Profeſſor GOELICKE, 1724, has propoſed a new Method of removing the *Cilia*, rather by Cauſtics with *Lap. infernal.* than by Amputation. When the Patient is laid on his Back, he directs firſt to arm and defend the Eye with Lint or Leather, and then to rub the *Cilia* with ſtrong *Lapis infernalis*, till the cartilaginous Margins of the Eyelids with their Hairs are eroded and removed; after which you are to dreſs firſt with dry Lint, and then with a *Collyrium ex Aq. Roſar. & alb. Ovor.* to be often renewed. The next Day you muſt remove the Lint, or leathern Defenſative from the Eye, to avoid an Inflammation from it; and if any ſmall Eſchar ſhould be formed underneath the ſame, it may be removed by ſome digeſtive Ointment; by which means, if you clear the Eye well from the Lint, he aſſerts that the Wound will be cured generally within the ſpace of ſix or eight Days.

CHAP. XLVII.

Of the Ancyloblepharon, *or Concretion of the* Eyelids.

Deſcription.

I. THE Diſeaſe termed *Ancyloblepharon*, is when the Eyelids cohere, or grow to each other, or to the Eye itſelf; being eaſily diſtinguiſhable from the glueing up of the Eyelids in the Small-pox and Inflammations, by an Inſpiſſation of the Juices and glutinous Matter, by which they are ſtrongly faſtened together for ſome time, but without intimately concreting, becauſe they ſeparate again ſpontaneouſly in a little time afterwards.

Cauſes.

II. Sometimes the Eyelids cohere, ſo that they cannot be opened, to admit the Light for Viſion, either in one or both of the Eyes, as in *Tab.* XV. *Fig.* 23 AA. Sometimes again the Eyelids grow to the Globe of the Eye itſelf, either to its *Tunica cornea*, *albuginea*, or both; which Accidents generally ariſe from violent *Ophthalmias*, Burns with Gunpowder, or other Fire, the Small-pox, cauſtic Remedies, or an Ulceration of the Parts from many other Cauſes. 'Tis true, this Diſorder is ſometimes born with the Infant; and may ſometimes ariſe in Adults from a fleſhy Excreſcence in the Angles of the Eyes growing to the Eyelids, as I had once an Inſtance myſelf. See *Miſcellan. Nat. cur. Dec.* II. *An.* VIII. pag. 135.

Prognoſis.

III. The Cure of all the ſeveral Species of this Diſorder is, in ſome meaſure, both doubtful and dangerous, but of none more than that in which the Eyelids are conjoined to the *Cornea*; for in that Caſe it will hardly be poſſible to free them without blinding, or at leaſt injuring the Patient's Sight. Nor is there leſs Difficulty to free the Eyelids from each other, when they cohere

from a Burn; and therefore in all Burns and Ulcerations of the Eyelids, great Care ſhould be taken to treat them with emollient and cooling Topics, and to keep them free from Adheſions, to which all inflamed and excoriated Parts are extremely ſubject. When the Eyelids grow together in the Small-Pox, they generally adhere at the ſame time to the *Cornea*, from whence they cannot eaſily be ſeparated without injuring the Sight; for after the adhering Parts have been freed from each other with the greateſt Judgment and Caution, there are almoſt conſtantly ſome little Scars or Specks left upon the *Cornea*, which greatly impede the Sight for the future, and which it will be almoſt impoſſible to remove.

Cure. IV. From what has been ſaid concerning the Nature of the Diſorder, you will readily conclude, that the Cure muſt conſiſt in a ſkilful Separation of the conjoined Parts; in order to which the Patient is firſt to be placed on a Bed or Chair againſt the Light, in the moſt convenient Poſition for the Operator, who is firſt to examine whether the Eyelids are totally conjoined, or whether there may not be ſome ſmall Interſtice left, which you will generally meet with in the greater or internal *Canthus* of the Eye next the Noſe. If the Eyelids are ſtrictly conjoined in every Part, you may then begin to make your Diviſion in either of the *Canthi*, or Angles, which appears to be moſt convenient; but with a ſoft Hand, and great Circumſpection, to avoid wounding the *Cornea*, or Eye itſelf. When you have made a ſmall Aperture, a Pair of Sciſſors, or *Scalpel*, with a blunt Point, are to be introduced, with which (*Tab.* XV. *Fig.* 25.) you gradually and carefully divide the Lids from each other: But if there is naturally left a ſmall Aperture betwixt the Eyelids, where they do not adhere, you may then immediately introduce one of the fore-mentioned obtuſe-pointed Inſtruments, and proceed to make your Inciſion; or, if you have none that are obtuſe-pointed, introduce a ſmall grooved Director, *Tab.* XV. *Fig.* 24. and then you may ſafely divide with the common ſort of Sciſſors, *Scalpel*, or a Lancet.

Adheſions of the Globe. V. When the Eyelids have been carefully ſeparated from each other, you muſt then examine with a Probe, whether they adhere to the Eye itſelf, which if they do, you muſt again free them cautiouſly with an obtuſe-pointed *Scalpel* or Lancet; but when the whole Globe, or the greater Part of the Eye, is firmly attached to the Lids, the Operation is both difficult and dangerous, as it will be almoſt impoſſible to free the *Cornea* without injuring the Sight; which Accident may be avoided, and the Cure more eaſily obtained, when the Lids adhere only to the *albuginea Tunica* of the Eye; even Wounds of the laſt mentioned Tunic are of ſo little conſequence, that I would always chuſe rather to cut off part of that in dividing them, than to leave part of the internal Membrane of the Eyelid adhering to it; for the internal Tunic of the Eyelids cannot be amputated without inducing great Injuries on the lacrymal Gland and Duct; and therefore it is highly neceſſary for this Operation to be performed by an expert and ſteady Hand.

Treatment after the Operation. VI. When the Lids have been freed from the Globe of the Eye, the next Buſineſs is to prevent them from joining again, which they will certainly do, if not prevented by interpoſing ſome Lint, or a thin Plate of Lead, Wax, Leather, or a bit of Gold-beaters Skin, cut in the Shape of a Half-moon, and moiſtened with *Ol. Amygd. dulc.* Either of theſe are to be left ſeveral Days in the

Eye, till there is no Danger of future Adheſions; and if they ſhould fall, or be taken out, they muſt be again replaced in a ſhort time. If the Patient cannot bear the Interpoſition of the fore-mentioned Plates, as is ſometimes the Caſe, he muſt then frequently agitate and work round his Eyelid, at Intervals, after having uſed a *Collyrium ex Aq. Plantag. Lap. tutiæ pp. & Sacc. Saturni*, or a Powder prepared *ex Saccharo, Margaritis & Lap. Cancror.* And, laſtly, the Surgeon himſelf muſt ſometimes paſs the obtuſe End of a Probe betwixt the Lids and the Globe of the Eye, to free and keep them from Adheſions.

Adheſions in the Small-Pox.

VII. When the Eyelids are glued together by a gummoſe and inſpiſſated Matter in the Small-pox, and Inflammations of that Organ, ſo that they cannot eaſily be opened, they ſhould never be forcibly pulled aſunder, but be firſt moiſtened a conſiderable time with warm Milk, and other emollient Topicals, by which means the Patient will generally be able to open the Eye himſelf ſoon after.

CHAP. XLVIII.

Of the Everſion and Gaping of the Eyelids, *termed* Ectropium *and* Lagophthalmia.

Origin of the Diſorder.

I. WHEN the Eyelids are everted or retracted, ſo as to ſhew their internal or red Surface, and cannot ſufficiently cover the Eye, the Diſorder is then denominated *Ectropium* and *Everſio Palpebrarum*, by the *Greeks* and *Latins*. When the upper Eyelid only is thus diſordered, it is then denominated *Lagophthalmus*, *Oculus leporinus*, or Hare-eyed. Some indeed will have the *Lagophthalmia* a Retraction of the upper Eyelid without any Everſion, ſo that it cannot cover the Eye; which Accident does alſo happen to the lower Eyelid, as I have often obſerved, without any Everſion, though it is not mentioned by others as a Species of the *Ectropium*. Sometimes this is a ſimple or original Diſorder, and ſometimes only a Symptom or Conſequence of another, as an Inflammation, *Sarcoma*, Tumor, *&c.* When the Diſorder is ſimple, or original, it generally ariſes from a Contraction of the Skin of the Eyelid by the Scar of a Wound, Ulcer, Burn, *&c.* or from an Induration and Contraction of the Skin after an Inflammation; and ſometimes it may proceed, in a great meaſure, from the Uſe of aſtringent *Collyria*, injudiciouſly applied in Diſorders of the Eyes.

Cure by Medicines.

II. The Cure of this Diſorder conſiſts in relaxing and elongating the external Skin of the Eyelid, ſo as to cover the Eye, which is often no eaſy Taſk to perform, eſpecially when the Diſorder is become inveterate. When the Diſorder is recent, it will be beſt to try the Application of Emollients; ſuch as the Vapours of hot Milk or Water, Oil of Amonds, or Olives, Mucilage of Quince-ſeeds, Hare's Fat, *Ung. Dialthææ*, &c. which muſt be continued for ſeveral Days on the Scar or contracted Skin of the Eyelid, which muſt be often extended either upwards or downwards, according as the Diſorder is either in the upper or lower Lid. And every Night, when the Patient goes to Bed, it will be proper to bring the Eyelids cloſe to each other, and to reſtrain them ſo by Plaſter, Compreſs, and Bandage, to be repeated or renewed every Night; but if none of theſe Means take

take effect, you muſt then have recourſe to the Operation, when you judge the Caſe curable, which is performed in the following manner:

III. Firſt you make a ſemilunar Inciſion in the external Skin of the Eyelid, next its *Tarſus*, or cartilaginous Margin, making the Angles of the Inciſion downward in the upper Lid, and upward in the Lower Lid (as in *Tab.* XV. *Fig.* 26 AA.) that, by this means, the Skin may be elongated. If the Skin does not appear to be let out enough by one Inciſion, you muſt make two or three more, running parallel with the firſt, and about the diſtance of a ſmall Packthread from each other; and when the Eyelid is thus ſufficiently elongated, you muſt dreſs the Wound firſt with dry Lint ſtuffed into the Inciſions, and then with Lint armed with ſome vulnerary Unguent, which will both prevent the old Skin from uniting again, and at the ſame time cauſe new Fleſh to ſprout up in the Inciſions, which will elongate the Skin; and, laſtly, to forward the Extenſion and Cure, a piece of ſticking Plaſter ſhould be faſtened to the margin of the Eyelid, to keep it extended either up or down; which method is to be continued till the Eyelids will ſhut cloſe. Cure by the Operation.

IV. When the Diſorder ariſes from an Inflammation, or fleſhy Excreſcence within-ſide the Lid, you muſt, in that Caſe, firſt remove the Inflammation by the Remedies we have elſewhere preſcribed for that Purpoſe, and then, after arming the Eye with a defenſative Plate, remove the Excreſcence by *Lapis infernalis*. And thus, by removing the Impediments, the Eye will recover its former Action. When the Diſorder proceeds from an *Encanthis*, *Hyperſarcoſis*, or *Sarcoma*, as in *Fig.* 27, 28, 29. *Tab.* XV. you may remove it by the Directions we ſhall preſently give in the two following Chapters. When the Diſorder is from an Inflammation or a *Sarcoma*.

V. When the Skin of the Eyelid has continued violently diſtorted or contracted from the Patient's Birth, there is ſeldom any Hope of curing it; and it is ſtill more impoſſible to obtain a Cure, when the lower Eyelid is everted through a Weakneſs of the orbicular Muſcle in old People, without any Appearance of a Scar, in which Caſe the Operation will be to no purpoſe. If any good can be done, it will be moſt likely by corroborating and ſpiritous Medicines both external and internal. But, in general, this Diſorder is always the more obſtinate and difficult to cure, as it is more inveterate, or of longer Standing. We have a learned Diſſertation *de Ectropio* by KECKIUS, *ſub præſidio* ZELLERI, *Tubing. An.* 1733. When the Diſorder is incurable.

CHAP. XLIX.

Of the Encanthis.

I. WE ſometimes meet with a Tubercle, formed in the greater or internal *Canthus* of the Eye, growing out either from the *Caruncula lachrymalis*, or from the adjacent red Skin; which Tumor is ſometimes large enough, not only to obſtruct the *Puncta lachrymalia*, but alſo part of the Sight, or *Pupilla* of the Eye itſelf[a]. In this Diſorder the Tears continually run down the

[a] See a Figure of a large *Encanthis* in PURMANNUS's *Chirurgia curioſa*, pag. 134.

Cheek,

Cheek, which greatly deforms the Eye and Face, and gives riſe to an *Ophthalmia*; ſee *Tab.* XV. *Fig.* 27 A. This Tubercle, denominated *Encanthis* by the *Greeks*, is of two kinds; the mildeſt of which is that without Hardneſs and Pain; but the moſt obſtinate and malignant Species is livid, and very painful, tending, in ſome meaſure, to a cancerous Nature.

Treatment of the firſt Species.

II. In the Beginning of the mild Species of the *Encanthis*, it will be highly uſeful to ſcarify firſt, and then to apply ſome mild eſcharotic or cauſtic Medicine; of which the moſt innocent is a Powder of *Sacchar. Canarienſ. & Vitriol. alb. aut Alum. uſt.* in the proportion of five parts of the firſt to one of either of the laſt. A little of this Powder being carefully ſprinkled upon the Tumor, is afterwards to be waſhed out of the Eye with warm Water. If this proves inſufficient, you may ſometimes touch the Tubercle with *Lapis infernalis*, but with great Caution. But to turn off the Humours from the Eyes, and prevent a Relapſe of the Diſorder, you muſt have recourſe to Iſſues or Setons, with *Phlebotomy*, and cooling Purges. If you find, that the Application of Medicines takes no effect, or if the Tubercle is of the malignant Species, you then extend or draw it out either with a Hook, *Tab.* XV. *Fig.* 30, 31. or a Pair of Pliers, or elſe, when it is very large, with a Needle and Thread paſſed through it, and tied together like a Sling for a Handle; by which you muſt gradually and carefully extend and draw up the Tubercle, in order to avoid wounding the Eye itſelf, or the lachrymal Caruncle, which would be attended with very bad Conſequences. For as the lachrymal Caruncle, in the greater *Canthus* of the Eye, ſtops and prevents the Tears from overflowing, and running down upon the Cheek; if you was to cut off part from it, the Conſequence would be a watery Eye, or a conſtant Flux of Tears over the Cheek. It is therefore rather better to leave Part of the morbid Tubercle, than cut off any Part of the lachrymal Caruncle; becauſe any Remains of the firſt may be afterwards cleared away by degrees with Eſcharotics, if you cannot take it off with a Pair of Sciſſors. After an Extirpation of the Tubercle you muſt apply deterging and healing Medicines, or a *Collyrium ex Lap. Tutiæ, Myrrhæ*, &c. till the Wound is healed.

Treatment of a malignant *Encanthis*.

III. In a malignant *Encanthis*, inclining to be cancerous, being hard, livid, and very painful, 'tis generally better to let it alone, and to mitigate its Uneaſineſs with cooling and lenient *Collyria*, rather than to exaſperate it by the Operation, or by eſcharotic Medicines; otherwiſe you may perhaps bring on Symptoms worſe than the original Diſeaſe, as is frequently done in cancerous Diſorders by improper Treatment. We have an extraordinary Cure of this Diſorder related by PURMANNUS in his *Chirurgia curioſa*; in which, after having extirpated the very large Tubercle by Ligature, he applied an actual Cautery to its Root with Succeſs.

CHAP. L.

Of the Sarcoma *and* Hyperſarcoſis, *or Excreſcence formed betwixt the Eye and its Lids.*

Deſcription.

I. RELATED to the foregoing Diſorder are thoſe Tubercles, or fleſhy Excreſcences, on the inner Surface of the Eyelids, termed by the *Greeks Sarcomata* and *Hyperſarcoſes*, (ſee *Tab.* XV. *Fig.* 28, 29.) which, in the Beginning,

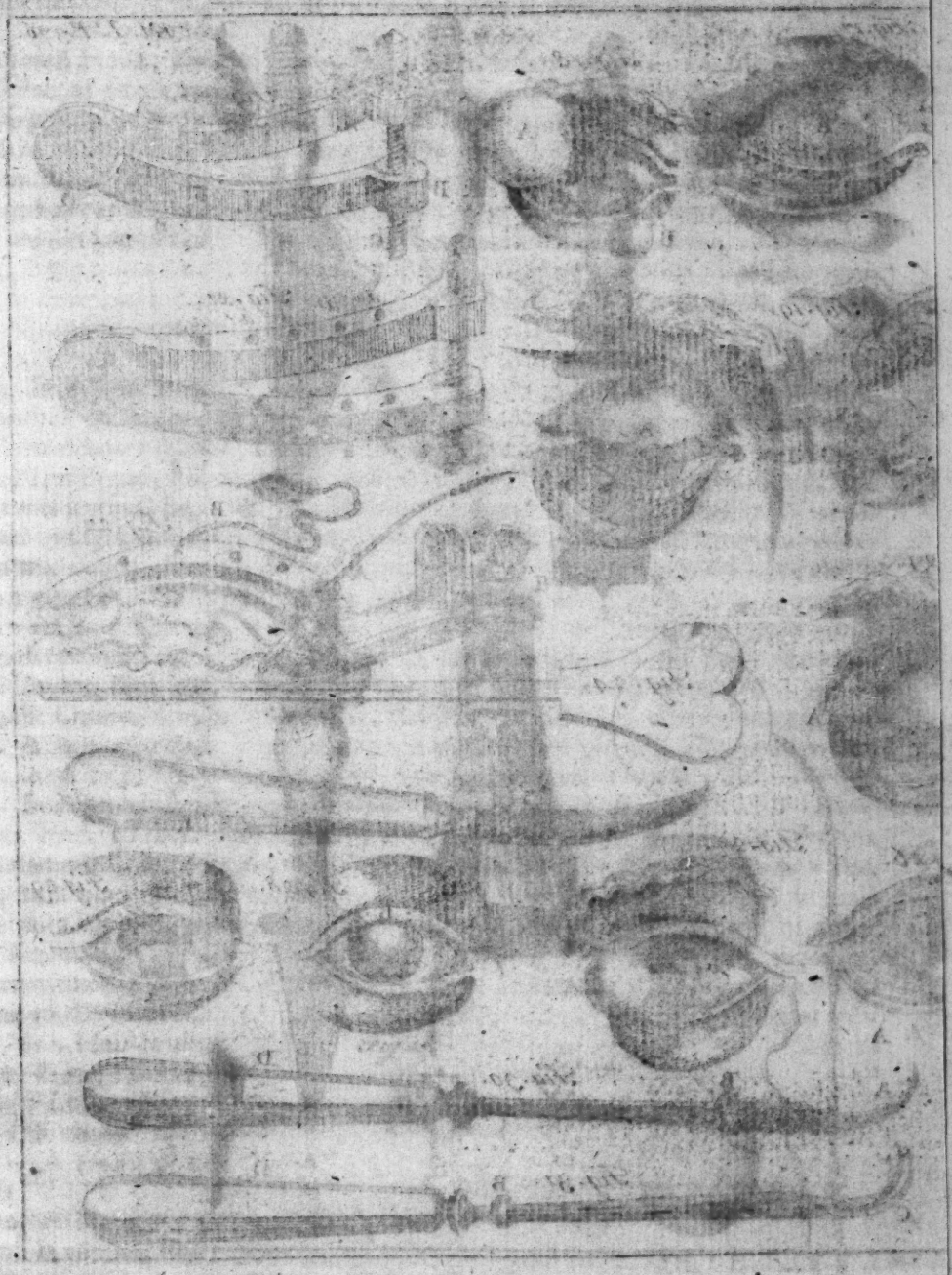

Plate 15.

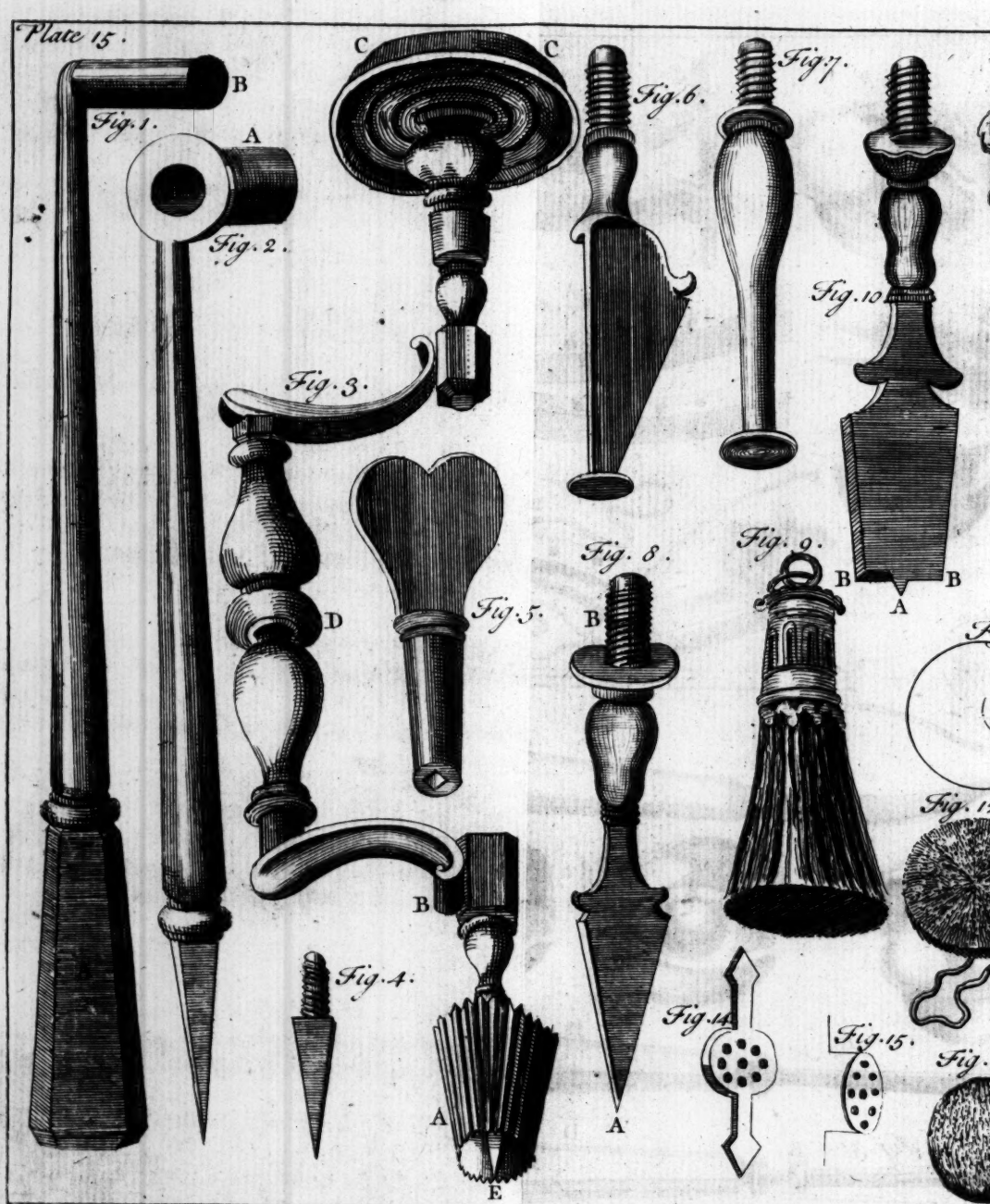
Fig. 1.
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Fig. 2.
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Fig. 3.
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Fig. 4.
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Fig. 10.
Fig. 14.
Fig. 15.

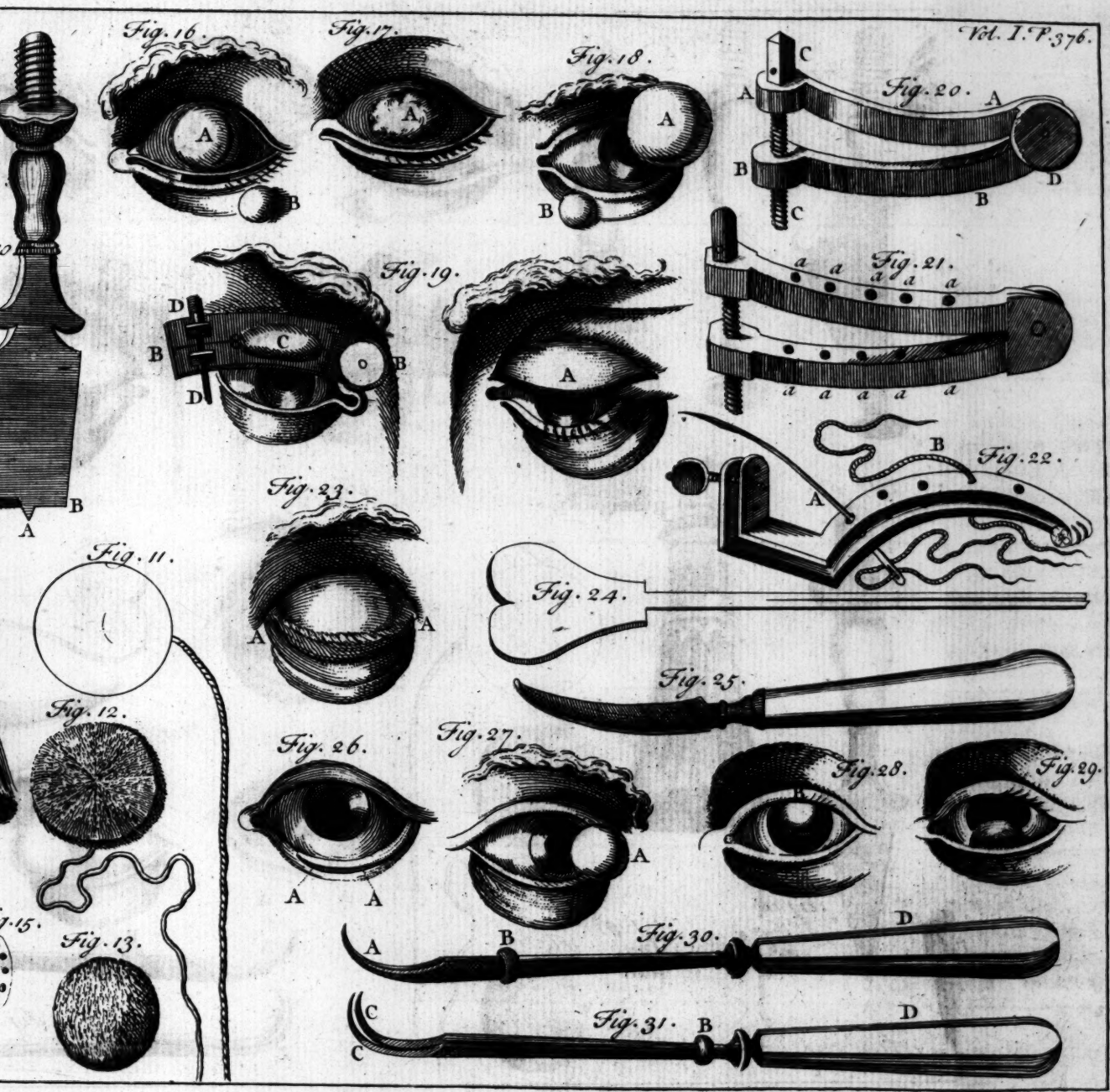
Fig. 16.
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Fig. 30.
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Fig. 31.
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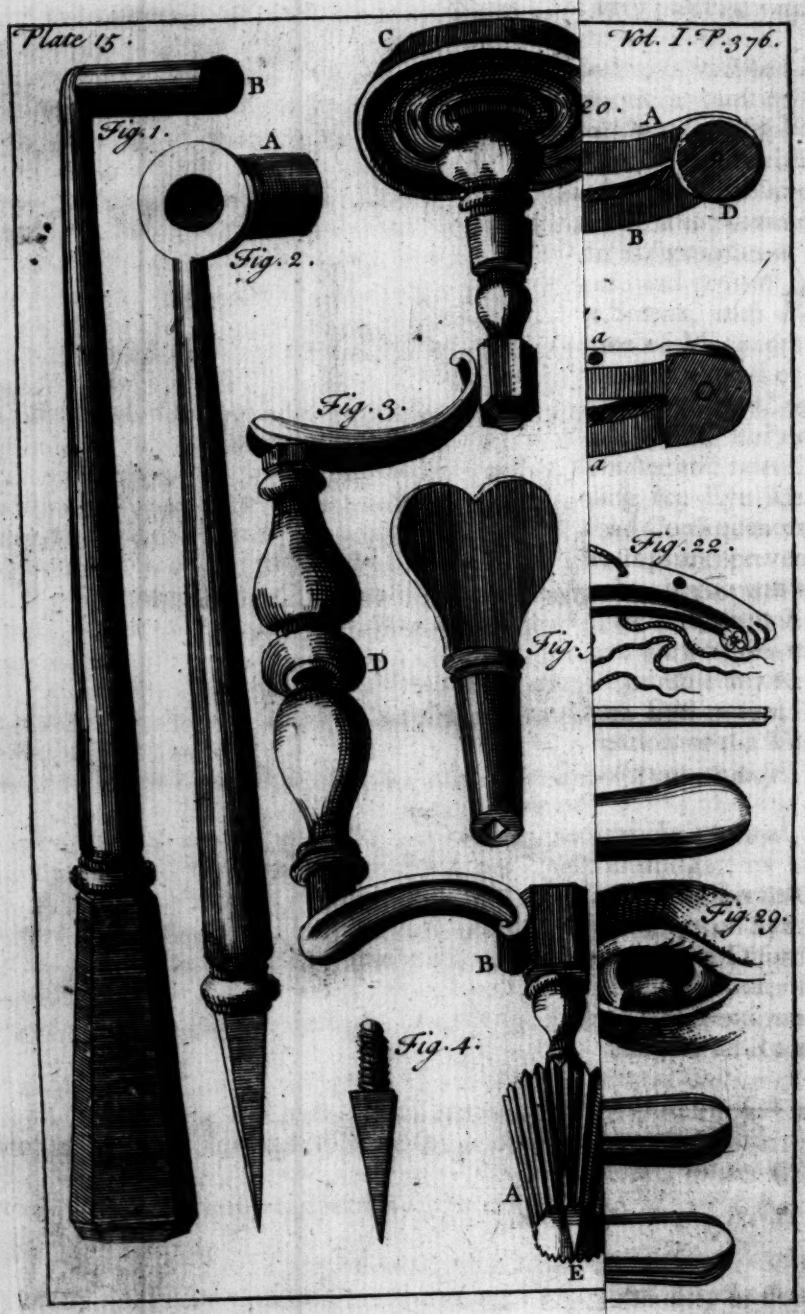
Fig. 1.
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Fig. 4.
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Fig. 22.
Fig. 29.

ning, are uſually very ſmall, but by degrees advance to a conſiderable Bulk. Some of them are ſmooth and even ſurfaced, and ſome again are rough and unequal like the Raſberry or Mulberry; of which Excreſcences I have ſeen and cured ſeveral.

II. I generally remove theſe Tubercles, firſt by carefully extracting them with a ſmall Hook, *Tab.* XV. *Fig.* 30, 31. and then cutting down to the Root with a Pair of ſmall Sciſſors, and, after letting it bleed a while, I order the Patient frequently to waſh his Eye with a *Collyrium ex Lap. Tutiæ, Aloë, & Sacchar. Saturn. in Aq. Roſar. ſolut.* till the Wound is healed. Inſtead of a Hook you may alſo extend the Tubercle, by paſſing a Needle and Thread through it. Some endeavour to remove theſe Tubercles by Eſcharotics, and *Lap. infernalis*; but I think Inciſion to be much ſafer, as well as more expeditious, and leſs painful. Cure.

An EXPLANATION *of the* FIFTEENTH PLATE.

Fig. 1. Is an Iron Cautery to make Iſſues in the Head, A the Handle, B the Cautery.

Fig. 2. A denotes the *Cannula* to receive and direct the Cautery, *Fig.* 1.

Fig. 3. The *Trepan* which I uſe; A denotes its *Crown*, B the Place where the *Crown* is ſcrewed on, C C the upper Part of the Handle, upon which the Hand is laid in the Operation. D the Arch of the Handle by which the Inſtrument is moved round, E a Spike in the *Crown*. The Moderns have a Method of faſtening the *Crown* on the *Trepan* otherwiſe than by ſcrewing; but this is my way.

Fig. 4. Repreſents the Spike taken out of the *Crown*.

Fig. 5. Is the Key or Winch, by which the Spike is taken hold of and ſcrewed into the *Crown*.

Fig. 6. A lenticular *Scalpel*, with which the rough Edge of the Bone is ſmoothed after the Uſe of the *Trepan*.

Fig. 7. Is a Steel Inſtrument, commonly called a *Depreſſor*, with a flat Button at its End, to preſs down the *Dura Mater*, and diſcharge the latent Blood. The ſame Inſtrument is alſo by ſome termed *Meningophylax*.

Fig. 8. Is a kind of *Terebra* to be faſtened to the Handle at B *Fig.* 3. after having taken off the *Crown*, being uſed to make the firſt Entrance for the Spike of the *Trepan*, and to perforate Bones in the *Spina ventoſa*, whence it is alſo ſometimes named the *perforating Trepan*, A denotes its Point, B the Screw to faſten to the Handle.

Fig. 9. Is a Hair-bruſh to cleanſe the Teeth in the *Crown* of the *Trepan*.

Fig. 10. Is the exfoliating *Trepan*, which is ſometimes uſed to pare away a *carious* Part in a Bone, A its Point, B B the Wings which ſcrape the Bone, when the Inſtrument is turned round.

Fig. 11. A Doſſil of Lint armed with a Thread, for dreſſing the trepanned *Cranium*.

Fig. 12. A Pledgit, or round Compreſs of ſcraped Lint ſecured with a Thread.

Fig. 13. Is another Pledgit of Lint without a Thread, to fill the Aperture of the *Cranium*.

Fig.

Fig. 14. Is the Leaden Plate of BELLOSTE, to defend the Aperture and Dreſſings.

Fig. 15. Denotes the Shape in which the ſaid Plate is to be firſt bent.

Fig. 16. A denotes an encyſted Tumor, or *Atheroma*, in the upper Eyelid, and B is another in the lower Eyelid.

Fig. 17. A large flat Wart on the upper Eyelid, having a ſlender Root, ſo as to fit it for Removal by Ligature with a piece of Silk.

Fig. 18. Is a *Sarcoma* or Excreſcence on the out-ſide of the Eyelid with a ſmall Root.

Fig. 19. Repreſents the *Phalangoſis* and *Ptoſis*, or Tumor, and Relaxation of the Eyelids. A denotes the Diſorder in the left Eye; BB an Inſtrument contrived by BARTISCHIUS, adapted to remove this Diſorder in the right Eye; DD a Screw by which the two Arms of the Inſtrument are approximated, or brought together.

Fig. 20. Is an Inſtrument like the firſt, but improved by VERDUYN, and as it is figured by RUYSCH *in Epiſt. Anat.* III. AA and BB denote the two Arms of the Inſtrument without any Perforations, to remove various Tubercles by approximating them by the Screw CC, and moving by the Hinge D, by which they are connected.

Fig. 21. Denotes the ſame Inſtrument of VERDUYN, only a little larger, and perforated with many ſmall Holes *aaaaa*, to make a Suture for this Diſorder of the Eyes.

Fig. 22. Is an Inſtrument for the ſame Uſe corrected by RAW, and taken from his *Epiſt. de Septo Scroti*, being made more crooked, and ſhutting differently. A the manner of paſſing the Needle through its Apertures; B the Thread drawn through to conjoin the Wound of the Eyelid.

Fig. 23. Exhibits an Eye with the *Ancyloblepharon*, or Concretion of the Eyelids, marked AA.

Fig. 24. Is a ſmall grooved Director, ſometimes uſeful to divide Concretions of the Eyelids.

Fig. 25. A ſmall *Scalpel* with an obtuſe Point, uſed in ſeveral Diſorders of the Eyes.

Fig. 26. Repreſents the manner of inciſing the lower Eyelid in the *Ectropium*, or *Lagophthalmia*, or Everſion and Retraction of the Eyelids.

Fig. 27. Repreſents an *Encanthis*, or Excreſcence in the Corner of the Eye near the Noſe.

Fig. 28 and 29. Denote a *Sarcoma* and *Hyperſarcoſis*, or fleſhy Excreſcence within-ſide the Eyelid; that marked A belonging to the lower Eyelid, and that at B to the upper Lid.

Fig. 30. Repreſents a ſmall Hook, for elevating and extending thoſe Tubercles, to extirpate them, the crooked Point of which may be made either ſingle or double, as you may ſee by removing the Gripe B in *Fig.* 31, where CC denote the two Prongs, DD the Handle.

CHAP.

CHAP. LI.

Of Bleeding in the Eyes.

I. THOUGH Blood-letting in the Eyes has been, a few Years ago, advanced by the *Engliſh* Oculiſt Mr. WOOLHOUSE, as an Invention of his own; yet it manifeſtly appears from various Treatiſes, that the Operation was both known, deſcribed, and practiſed above an hundred Years before among the *German* Phyſicians[a]. This Operation is cried up by Mr. WOOLHOUSE, as of greater Conſequence than any other Diſcovery in Phyſic; he even thinks it preferable to the celebrated Philoſopher's Stone[b]. Not a new Diſcovery.

II. Blood-letting may be ſucceſsfully uſed in the Eyes: 1. Whenever thoſe Organs are inflamed, that is, when the Blood-veſſels, ſpent on the White of the Eye, appear much larger and more numerous than uſual; wherein it will often ſucceed, when other Medicines, and even *Phlebotomy*, have been tried without their due Effects, and when the Inflammation runs to ſuch a Height as to endanger the Sight. 2. It may be uſed to Advantage when the *Cornea* is infeſted with Specks or Abſceſſes; for, after dividing the Veſſels which ſupply the Diſorder, it may be much more eaſily removed. 3. It may be uſed when a red Coat or Film grows upon the Eye; for the oftener the Veſſels are inciſed, which nouriſh the Film, the ſooner it will ſhrink, and diſappear. Laſtly, 4. it may be uſed by way of Prevention, when the foreſaid Diſorders have been removed, and threaten a Return, by the Intumeſcence of the Veſſels in the White of the Eye; in which Caſe you therefore ought to inciſe the turgid Veins, and foment them. In what Caſes uſeful.

III. There are ſeveral ways of performing this Operation, of which we ſhall here only relate the chief. Firſt, the Patient is to be ſeated conveniently on the Bed-ſide, or on a Chair, with his Head held in a proper Poſture by the Aſſiſtant; which done, the Surgeon makes a tranſverſe Inciſion with a Lancet upon the turgid ſmall Veins in the Corners of the Eye, ſo as to open them, or cut them quite aſunder. Some uſe a ſmall Pair of Sciſſors, inſtead of a Lancet, to divide the Veſſels; but, in uſing either of them, the Eyelids muſt be held apart from each other by the Fingers of one Hand, while the Veſſels are inciſed by thoſe of the other. Some, again, elevate the ſmall turgid Veins with a crooked Needle before they divide them, the Eyelids being in the mean time held aſunder by an Aſſiſtant[c]. But it would be ſtill better to have theſe crooked Needles made thin and double-edged, ſo that they may divide the Veſſels, of themſelves in the Elevation, without the Uſe of Lancet or Sciſſors. Laſtly, there is no material Objection, why this Operation may not be almoſt as advan- Method of Operating.

[a] See MAUCHART *in Diſſert. de Ophthalmozyſi*, pag. 18. FELIX PLATERUS *Prax. Med.* 8, Lib. I. *Tit. de Viſûs Læſ.* 1609. pag. 280. *& 4to Baſil.* 1656. pag. 238. He is again cited on this Head by M. A. SEVERINUS *in Medicinâ Efficaci, Anno* 1682. *edit.* pag. 50. Chap. X. which treats of letting Blood in the Eyes.

[b] See the *Diſſertations ſçavantes & critiques de M.* WOOLHOUSE, *pag.* 310. and *Diſſert. Ophthalm.* pag. 224.

[c] This is the Method preferred by M. St. YVES in Lib. *De Morb. Oculor.* pag. 195.

tageouſly performed by the ſcarifying Inſtrument we ſhall deſcribe in the following Chapter.

What is to be done after the Operation.

IV. The ſmall Veins being thus inciſed or divided, their Diſcharge of Blood ſhould be promoted by Fomentations of warm Water, or a Decoction *ex Euphraſiâ, Hyſſop, Veronicâ, &c.* frequently applied to the Eye by means of a Sponge, or ſoft Linen Rags. For this Operation will be more ſerviceable, as the Diſcharge is procured more copious; but if once performing it does not ſuffice to remove the Swelling and Inflammation, it may be ſafely repeated two or three times more, aſſiſting it, in the mean time, with the uſe of a proper Regimen, Diet, and Medicines both external and internal. I muſt indeed confeſs, that after having performed this Operation myſelf on ſeveral Patients, firſt at *Altorf*, and ſince at *Helmſtadt* in *Germany*, I could not poſſibly prevail on them to have it repeated, and it was with the greateſt Difficulty that they were perſuaded to it at all; ſome being deterred from it by fear of loſing their Eye-ſight, and others upon the account of the great Pain which it muſt neceſſarily inflict on this tender Organ. The Reaſon of its being ſeldom performed on Infants, is the Difficulty of perſuading them to hold their Head and Eyes ſteady; and the Danger of applying a Lancet, or other ſharp Inſtrument, when thoſe Parts are in Agitation, is very apparent to every one.

Another Method.

V. To this Operation is related that by Inciſion, propoſed in a Diſſertation under CAMERARIUS at *Tubingen*, *An.* 1734. for a venereal *Ophthalmia*, in the moſt violent Symptoms of which Diſorder it is propoſed to make a circular Inciſion in the White of the Eye round the *Cornea*, to diſcharge the ſtagnant Blood, or other Matter diſtending that Membrane, and obſtructing its Veſſels; but whether this is a ſafe and uſeful Practice, or whether it may not be uſed with Succeſs in other violent *Ophthalmia*'s, as well as the Venereal, can be only aſcertained by the beſt of Teachers, Time and Experience.

CHAP. LII.

Of Scarifying the Eyes.

Coincides much with the laſt Operation.

I. SCARIFICATION of the Eyes agrees, in many reſpects, ſo much with the Bleeding of them, deſcribed in the laſt Chapter, that it is no great Wonder Mr. WOOLHOUSE, though a famous Oculiſt, ſhould confound them one with the other. But I think there is a manifeſt Difference, at leaſt enough for any one to diſtinguiſh betwixt them, becauſe the Parts are different; for the interior Surface of the Eyelids is here the Subject of Scarification, as well as the White of the Eye, to which the foregoing Operation is confined, and then again they are each of them performed by different Inſtruments, as will preſently appear.

Not a new Operation.

II. That Scarification of the Eyes is no modern Invention, is apparent from its having been deſcribed and performed by HIPPOCRATES[a], CELSUS[b], ÆGINETA[c], and others among the ancient Phyſicians. But there are ſeveral Reaſons to be offered for its having come into Diſuſe with the Phyſicians of the

[a] Lib. *de Viſione.* [b] Lib. VI. Cap. VI. N° 26. [c] Lib. III. Cap. 22. *de Trachomate.*

ſuc-

ſucceeding Ages. It might be owing partly to its ſeeming a difficult, dangerous, and very painful Operation, and partly from their judging it to be of little or no Efficacy, as we find by many of their Writings. However, the firſt that revived the Practice among the Moderns, after it had lain neglected for ſo many Ages, was the celebrated *Engliſh* Oculiſt Mr. WOOLHOUSE.

Method of Operating.

III. To ſcarify the Patient's Eye, he muſt be firſt ſeated on his Chair or Bed in an advantageous Poſture againſt the Light, with his Head ſecured from moving by an Aſſiſtant, after which the Operator preſſes his Thumb and Fore-finger on the Eyelids, ſo as to elevate, or open, and turn them outward, that their interior red Surface may come into View; which may be done with moſt Eaſe in the lower Eyelid. He now takes his ſcarifying Inſtrument in the other Hand, and rubs it backward and forward with great Swiftneſs upon the internal Surface of the Lid, and upon the White of the Eye itſelf, if he thinks proper, and ſometimes even upon the *Cornea*, moving from one Corner of the Eye to the other, ſo as to lacerate the ſmall turgid Veins, and make them bleed plentifully. But this in general is an Operation much ſooner learnt from Inſpection, than a verbal Deſcription.

Treatment after the Operation.

IV. The Diſcharge of Blood from the ſcarified Veſſels ſhould be promoted as much as poſſible by the Applications propoſed for that Uſe in the preceding Chapter, at *Sect.* IV. which will alſo cleanſe the Eye, and abate its Inflammation at the ſame time. But, in order to prevent the ſcarified Parts from adhering to each other, they ſhould not be bound up, at leaſt in the Day-time, but the Lids ought to be frequently agitated by the Patient; and if they are bound up at Night, you ought firſt to interpoſe a bit of Gold-beater's Skin, or ſome ſuch Subſtance, to keep them aſunder. Mr. WOOLHOUSE recommends the Interpoſition of three or four Seeds of Clary for this Purpoſe, or rather a bit of Gold-beater's Skin anointed with ſome Eye-ſalve; for without ſome ſuch Precaution you will hardly avoid a Concretion or Adheſion of the Parts ſcarified. How long the Scarification muſt be continued, or how often repeated, will belong to the prudent Phyſician to determine, from the particular Circumſtances of the Caſe; but, in the mean time, it will be highly neceſſary to call in the Aſſiſtance of a proper Regimen, Diet, and Exhibition of both external and internal Medicines; for, by neglecting theſe Helps, your Operation may not only prove ineffectual, but perhaps induce a worſe Diſorder on the Eye. Conſult PLATNERUS's Diſſertation *De Scarificatione Oculorum*, pag. 36, *& ſeq.*

The Inſtruments to be uſed.

V. The Inſtruments uſed by different Authors for this Operation, are various: HIPPOCRATES ſeems to have uſed a ſort of prickly Thiſtle, like the *Atractylis*. Some of the ancient Phyſicians ſcarified with a ſmall Steel Raſp in the Shape of a Spoon; ſee *Tab.* XVI. *Fig.* 5. with which they rubbed the internal Surface of the Eyelid till it bled, as we read in CELSUS (*Lib.* VI. *Cap.* VI. N° 26.) and ÆGINETA (*Lib.* III. *Cap.* XXII.) the firſt of which Authors calls it *Specillum aſperatum*, and the laſt *Blepharoxyſton*. Others uſe the rough Plant named by Botaniſts *Equiſetum magis nudum*, which ſeems to be very well adapted to the Intention. Others again recommend the Pumice-ſtone, *Os Sepiæ*, *&c.*

The lateſt and beſt Inſtrument.

VI. But the lateſt and beſt Inſtrument for this Operation is found to be the Beards of Barley or Rye, which are furniſhed with Rows of ſmall Teeth or Hooks denoted by A in *Fig.* 3. *Tab.* XVI. Ten, twelve, or fifteen of theſe

Beards are to be cut and tied together by a String, ſo as to reſemble a ſort of Bruſh for Clothes, as in *Tab.* XVI. *Fig.* 4. the Teeth of each Beard or Spike being turned outward all round, their ſlender Ends form a ſort of Handle A, to be held and worked round and acroſs by the Fingers, to ſcarify the Inſide of the Eyelids, and the Eye itſelf with the Part B.

Its Inventor. VII. The firſt Contriver of this Bruſh for the Eyes appears to be Mr. Woolhouse the Oculiſt, who, though he preached up the great Uſes of his Inſtrument to his Pupils, yet ſtudiouſly endeavoured to conceal it, and its Application, from them, till in 1726 M. Mauchart (preſent Profeſſor at *Tubingen*, and Archiater to the Duke of *Wirtemberg*) his *quondam* Pupil, publiſhed both his Inſtrument and its Uſes, with the Method of applying it; and, about two Years afterwards, the celebrated Platnerus of *Leipſic* explained the whole Buſineſs more at large, in a Treatiſe *de Scarificatione Oculorum*; in which we have the Figure of the Eye-bruſh uſed by Mr. Woolhouse, as you find it repreſented by me in *Tab.* XVI. *Fig.* 4.

Uſes of the Eye-bruſh. VIII. This Eye-bruſh, or Scarificator, is ſaid by the Author, Mr. Woolhouse, to be very uſeful in all Diſorders of the Eyes which require bleeding, as when the ſmall Veſſels are obſtructed, and the whole Eye inflamed, whether from external or internal Cauſes, as a Blow, Wound, *Cataract*, *Pterygium*, *Hypopion*, *Staphyloma*, or the like, in which Caſes the internal Surface of the Eyelids ſhould be chiefly ſcarified, in order to diſcharge the heſitating Blood. And, if we may credit Mr. Woolhouse, this Practice is more effectual in removing Inflammations, induced by external Cauſes, or a Chirurgical Operation, than in original *Ophthalmia*'s or Inflammations of the Eyes. But in the *Chemoſis*, or moſt violent Inflammation of this Organ, it will be neceſſary to ſcarify the Eye itſelf with this Bruſh, as well as the internal Surface of its Lids. 2. He aſſigns the Uſe of his Bruſh to be for the Removal of the Pterygium, Abſceſſes, and white or other coloured Specks and Films on the Eye; for by ſcarifying the *Tunica albuginea* of the Eye, and ſometimes the *Cornea* itſelf, or rather the *Pterygium* upon the *Cornea*, the Veſſels which ſupply thoſe Impediments and Blemiſhes of the Sight are lacerated, and, with the Uſe of other Medicines, deſtroyed; and conſequently they muſt, in a little time, dwindle and diſappear. 3. He judges his Inſtrument highly ſerviceable in ſtrengthening and recovering a weak or impaired Sight, or even to remove an *Amauroſis*, or Cataract, which are not of any long ſtanding; for, by the ſtrong *Stimulus* of this Operation, the ſtagnant Humours are put into Motion, the obſtructed or compreſſed Nerves and Blood-veſſels are again opened, and rendered pervious, and the Eye, by that means, reſtored to its priſtine Vigour. 4. The *Ophthalmoxyſis*, or Bruſhing up of the Eye, is very ſerviceable for the Cure of an *Atrophe*, or *Tabes* of that Organ, as it occaſions a greater Influx of Juices to the Parts, which are therefore ſupplied with more Nouriſhment. 5. This Operation may contribute to the Cure of an *Hypopyon*, or *Hypohæma*, that is, a Collection of Blood or Matter under the *Cornea*, occaſioned by ſome Blow, or other external Violence, which muſt be diſperſed, in order to clear the Sight. 6. This is no deſpicable Remedy for eaſing and removing intenſe Pains, termed by the Ancients *Ophthalmoponia*, and when the Light itſelf is intolerable to them; for this being an internal Inflammation of the Eye, cauſed by an Obſtruction and Diſtenſion of the Veſſels near the *Retina*, the Blood diſcharged by ſcarifying with this Bruſh, muſt

muſt certainly draw off what is ſuperfluous, and greatly eaſe this ſenſible Part. And laſtly, 7. the Bruſh will be often found very uſeful and neceſſary in Palſies, incipient Mortifications, and many other Diſorders of the Eyelids, as well as of the Eyes themſelves. See PLATNERUS *de Scarificatione Oculorum*, pag. 37, *& ſeq.*

When Scarification is improper.

IX. But it is not to be imagined this Inſtrument will be uſeful in all Diſorders of the Eyes indiſcriminately, as PLATNERUS obſerves; for it will be improper, 1. in a dry *Lippitudo*, or *Xerophthalmia*, where the Eye is hot, dry, itches, and the Patient cannot look at the Light without great Pain. It will be alſo equally improper, 2. in Diſorders of the Eyes from a *Venereal* or *Scorbutic* Cauſe; for, without the Vices of the Juices be firſt corrected and removed, as this Operation augments their Influx upon the Parts, it may encreaſe, rather than relieve the Diſorder. Nor will it be to any Purpoſe to try the Bruſh, 3. in an old *Cataract*, *Gutta ſerena*, or *Hypopion*, where the Diſorder is become fixed and incorrigible by Length of Time. And, laſtly, you muſt not expect it to cure, 4. an *Ectropium*, *Trichiaſis*, *Anchyloſis*, and many other Diſorders of the Eyelids, for which it is not deſigned.

Concerning the Bruſh.

X. With regard to the Eye-bruſh before deſcribed, it is to be obſerved, that a ſmall Force will blunt it, and therefore it cannot well be uſed more than once; a new Bruſh muſt therefore be provided againſt every Operation. 'Tis to be likewiſe obſerved, that the Beards of old Barley are not ſo proper as thoſe of new, which is not altogether full ripe; becauſe the firſt, being very brittle, will be apt to ſhatter, and leave ſome of its Teeth behind in the Coats of the Eye, which may be followed with bad Conſequences. For the ſame Reaſons alſo it ſhould not be the Product of too rich a Soil, nor have paſſed under the Action of the Flail in threſhing the Grain.

My Opinion of the Operation.

XI. After all I muſt confeſs, that, upon Trial, I never could experience any great Effects from this Operation, which I have frequently performed in moſt Diſorders of the Eyes. And, what is more, I have known many Patients afflicted with various Diſorders of the Eyes, which have been reported by WOOLHOUSE and his Pupils, to be cured by this Practice, when the only real Advantage they received from it was the Abatement of their Pain; which I take notice of thus openly, leſt it might be imagined, I did not ſucceed for want of operating as I ought, in the manner of Mr. WOOLHOUSE. I muſt indeed own, that it makes an uſeful Evacuation in *Ophthalmia*'s, and have often experienced its good Effects in many inflammatory Diſorders of the Eyes, eſpecially when aſſiſted with *Phlebotomy* and Bliſters; and thus I make no doubt but its Author and his Followers may have cured many Diſeaſes of the Eyes; but it may in general be queſtioned, whether thoſe Diſorders would not have gone off as readily by Bleeding, Purging, Bliſters, and Scarification in other Parts, as by this Practice; at leaſt the Difference will hardly countervail the extraordinary Pain it gives. We know, that Diſorders of the Eyes were very well cured before the Diſcovery of this Practice by Mr. WOOLHOUSE, and may perhaps be better removed at preſent by ſome, who are ignorant of his *Apparatus*. At leaſt this I may venture to ſay, that if, with Difficulty and much Perſuaſion, you draw in the Patient to ſubmit once to ſo rough an Operation upon ſo tender an Organ, you will not find it practicable to allure him to it a ſecond time. Nor ſhall I inſiſt upon the ill Conſequences attending the Teeth of the Inſtrument being

left

left ſticking behind in the Coats of the Eye, and the wounding of the *Cornea*, *&c.* from the intenſe Pain obliging the Patient to move his Head and Eye, which may cauſe an Inflammation even worſe than the Original. Even the moſt prudent Oculiſts are obliged to own, that the Practice is beſet with many Inconveniences in the very Diſorders to which it is moſt adapted; nor can we meet with Examples enough of its good Effects to over-balance the Danger and excruciating Pain that attend it. I would therefore adviſe the young Surgeon not to be over-fond of his new Eye-bruſh, nor bring it into his Practice but in Caſes of the laſt Neceſſity, when all other Means are ineffectual. It is alſo remarkable, that, among the modern *French* Surgeons and Oculiſts, none take any notice of this Practice but St. Yves, notwithſtanding it made ſo much Noiſe at firſt; and in general the *French* Surgeons are very ſcanty and defective in treating on Diſorders of the Eyes.

CHAP. LIII.

Of the Epiphora, *or watery Eye.*

Nature of the Diſorder.

I. THE *Epiphora*, or watery Eye, is a Diſorder in which the Tears being obſtructed from paſſing through the lacrymal Ducts into the Noſe, are forced to run down over the Cheek with Deformity and Uneaſineſs to the Patient. There are ſome indeed who confound this Diſorder with the *Fiſtula lacrymalis*, but unjuſtly, becauſe in the laſt the Tears are not ſincere, but mixed with a purulent Matter flowing from an Ulcer in the lacrymal Sack. But that the nature of both theſe Diſorders may be the better underſtood, it will be proper to give you an Idea of the Courſe and Figure of the lacrymal Ducts, as you will find them repreſented in *Tab.* XVI. *Fig.* 6. where *a a* denote the *Puncta lacrymalia* in the Eyelid, *b* the *Caruncula lacrymalis*. *Fig.* 7 and 8 repreſent the lacrymal Ducts of each Eye ſeparated, and here entire; *a a* denote the *Saccus lacrymalis*, as it is called; *b b* the *Puncta lacrymalia*, with their ſmall Tubes or Ducts *c c*, leading into the lacrymal Sack; the Letters *d d* denote the *Canalis naſalis*, opening into the Noſe by the Aperture *e e*. In *Fig.* 9. you have a View of theſe Ducts annexed to the Eye, where the lacrymal Points are marked *a a*, the Caruncle *b*, the Ducts from the *Puncta lacrymalia c c*, leading into the *Saccus lacrymalis d*, thence into the *Canalis naſalis e*, and by that into the Noſe through the Aperture *f* *.

Cauſes.

II. This Diſorder of the Eye may proceed from many Cauſes, which impede or obſtruct the Paſſage of the Tears into the Noſe through the before-deſcribed Parts. Thus if the *Puncta lacrymalia* are ſtopped up, it will produce an *Epiphora*, or watery Eye; but as long as the Paſſages into the Noſe are clear, that Humour, which is ſeparated by the lacrymal Gland, to moiſten and

* This Paſſage of the Tears is by many thought to be a modern Diſcovery; but the celebrated Anatomiſt Morgagni, in his firſt and ſixth *Adverſaria Anatomica*, has demonſtrated the Courſe to have been known and obſerved by Galen, Vegetius, Berengarius, Fallopius, Carcanus, Steno, *&c.* After Morgagni this Part has been explained at large by Anelius *in Lib. de Fiſtulâ lacrymali*, and Meibomius *in Epiſt. de Vaſis Palpebrarum novis.*

cleanſe

cleanſe the Eye, will be drank in by the lacrymal Points, conveyed from thence into the Sack, and from thence it will by degrees paſs into the Cavity of the Noſe itſelf. The *Epiphora* may therefore proceed, (1.) From ſome hard Tumor or Tubercle in the greater *Canthus* or Angle of the Eye, obſtructing the *Puncta lacrymalia*. (2.) From a Contraction or Concretion of the *Puncta*, after a Wound, Ulcer, or Burn of the Eye-lid; and (3.) From the ſame Cauſes, or from an Obſtruction of the *Canalis naſalis*, as may frequently happen in an Inflammation, from an inſpiſſated or gummy Matter. (4.) It may be cauſed by a *Polypus*, Caruncle, or Excreſcence in the Noſe, compreſſing and occluding the lacrymal Duct internally. (5.) From a *Fiſtula lacrymalis*. (6.) An *Ectropium*, or Inverſion of the Eyelids. (7.) From an Eroſion, or Loſs of the *Caruncula lacrymalis*; and, laſtly, (8.) From a Wound in the lacrymal Duct, blocking up the ſame with an ill-formed Cicatrix.

III. The Diſorder itſelf may be readily diſcovered, both from the Looks and Relation of the Patient; but to find out its immediate Cauſe requires much more Attention. When it ariſes from a Loſs of the lacrymal Caruncle, a Diſtortion of the Eyelids, an *Encanthis*, or a *Polypus* in the Noſe, the Cauſe is generally obvious enough; but when it is from a Concretion of the *Puncta*, the Cauſe can only be known by Inſpection, and conſidering whether there has been any Wound or Burn, *&c.* When the *Puncta* remain open, and the naſal Canal is concreted or obſtructed, the Tears have a ready Admittance into the *Saccus*, but not into the Noſe, which therefore diſtends or dilates the Sack, from whence the Diſorder is ſometimes named a *Hernia lacrymalis*; and by ANELIUS it is termed a *Hydrops Sacci lacrymalis*[a]. In this Caſe, upon preſſing the Finger on the lacrymal Sack, it does not diſcharge its Contents into the Noſe as it ought, but the Tears return again through the *Puncta* into the Eye. See *Tab.* XVI. *Fig.* 10. A. Sometimes the lacrymal Sack is thus dilated, ſo as to form a very conſpicuous Tumor externally, which, by Preſſure with the Finger, will for the preſent be greatly diminiſhed, or elſe totally diſappear. If the Diſorder is at the ſame time accompanied with a *Fiſtula lacrymalis*, the aforeſaid Preſſure will diſcharge a purulent Matter along with the ſerous Humour; whereas in the ſimple *Epiphora*, it will appear quite limpid and aqueous. *Diagnoſis.*

IV. The *Prognoſis* and Treatment of this Diſorder will turn out various, according to the particular Cauſe and Circumſtances. When accompanied with an *Encanthis*, *Polypus* in the Noſe, a Diſtortion of the Eyelids, or a *Fiſtula lacrymalis*, the *Epiphora* cannot be cured till you have firſt removed thoſe Symptoms which cauſe it. When it ariſes from a Concretion of the *Puncta lacrymalia*, you ſhould carefully examine whether the Ducts leading into the *Saccus*, marked *c c*, *Fig.* 7 and 8, are all along cloſed and concreted, or whether their Orifices only are occluded with a thin Film; for if they are all the way concreted, whether from a Cicatrix, Wound, or Burn, there will be no Poſſibility of a Cure; whereas the thin Skin occluding their Orifices may be eaſily perforated with a ſmall Needle, and kept open, till they are healed, with a Briſtle, or Silver-wire, dipped in *Ol. Ovor.* as at *Fig.* 11, 12, 13. *Prognoſis and Cure.*

[a] In *Diſſert. ſur la nouvelle Decouverte de l'Hydropiſie du Conduit lacrymal.* Paris, 1716.

Obſtruction of the Duct.

V. If the *Puncta* appear to be pervious, and in their natural State, you may conclude the *Canalis naſalis* to be obſtructed; which being uſually occaſioned by a glutinous Matter, may be generally removed, ſo as to cure the Diſorder, if it has not been too long neglected. To diſperſe and remove the Matter, Diſcutients muſt be often applied with repeated Preſſure by the Finger, to expel the ſtagnant Humours, that they may not become acrimonious, and erode the Membranes. One of the beſt Diſcutients for this Purpoſe is a Tincture of Aloes diluted in ſome Eye-water, or an Infuſion of Hyſſop, Bettony [a], *&c.* In the mean time ſhould be ſometimes uſed a Sternutatory *ex Majoran. Lil. Conval. Mar. &c.* And if theſe Means prove ineffectual, you may treat the Patient in ANELIUS's new Method of curing a *Fiſtula lacrymalis*, by paſſing a ſmall Silver Probe, *Tab.* XVI. *Fig.* 11, 12, 13, into the *Puncta*, and through the lacrymal Duct and Sack into the *Canalis naſalis*, and ſo into the Noſe. But this is an Operation that ought not to be attempted by every one, who is not an expert Operator, and well verſed in the Structure of theſe Parts; otherwiſe you not only miſcarry in your Operation, but greatly injure the Patient. The Paſſages are to be thus cleared by the ſlender Probe every Morning and Evening, for ſeveral Days, injecting afterwards ſome of the before-mentioned Liquors by a ſmall Silver Syringe, *Tab.* XVI. *Fig.* 14. the ſlender Tube of which is to be inſerted into the lower *Punctum lacrymale*, as we ſhall more particularly direct in the following Chapter. And thus, by the repeated Uſe of Injections, the Diſorder will be either removed, or elſe degenerate into a *Fiſtula lacrymalis*, and muſt then be treated accordingly. Laſtly, when this Diſorder ariſes from a Loſs of Subſtance in, or an Eroſion of the lacrymal Caruncle, it will be to no purpoſe to uſe Remedies, becauſe the Caſe is incurable.

CHAP. LIV.

Of the Fiſtula Lacrymalis, *and of the Diſorders related to it.*

The *Fiſtula lacrymalis* deſcribed.

I. THE *Fiſtula lacrymalis* is generally underſtood to be a little Ulcer in the greater or internal *Canthus* of the Eye next the Noſe, which either of itſelf, or by Preſſure, diſcharges a purulent Matter. The Seat of this Ulcuſcle is in the *Sacculus lacrymalis*, or Paſſage for the Tears into the Noſe; and therefore the *Fiſtula lacrymalis* is more or leſs dangerous, in proportion to the Size and Condition of the Ulcer, which ſometimes lies concealed only in the *Sacculus*, and diſcharges its Matter through the *Puncta lacrymalia*; but ſometimes again it not only erodes the *Sacculus*, but alſo the external Skin, and the adjacent Bone. If the Skin is not eroded through, the *Fiſtula* is thence denominated *imperfect*, as it is termed *perfect* after having made its way through the Integuments [b]; but when it has alſo eat through the adjacent Bone, or rendered it *carious*, it is then uſually termed a *complicated Fiſtula lacrymalis*. It is

[a] This Infuſion is highly commended by SCHOBINGERUS, for a *Fiſtula lacrymalis*, in his Treatiſe on that Subject, P. 20.

[b] This Species of the *Fiſtula* is what CELSUS *(Lib.* VIII. N° 7.*)* ſeems to term *Aegilops*; but he does not ſpeak very intelligently of it in this Place.

remarkable, that the generality of Phyſicians and Surgeons had a wrong Notion of the Nature and Treatment of this Diſorder, till the beginning of the preſent Century; and their Error might be owing partly, (1.) To the Multiplicity of Diſeaſes to which this Part of the Eye is ſubject, and the Number of different Names which are frequently given to each of them. (2.) From the real Nature of the Diſorder having been examined into by very few Surgeons and Anatomiſts; for moſt of them imagined the Seat of the Ulcuſcule to be either in or under the lacrymal Caruncle; whereas the more accurate of the Moderns diſcovered, that the purulent Matter was diſcharged neither from nor behind the Caruncle, but rather out of the *Sacculus lacrymalis* through the *Puncta*[a]. Having acquired a wrong Idea of the Diſorder, they were conſequently led by that into a wrong Practice, both which the Moderns have endeavoured to correct, and not without Succeſs.

II. But that our Reader may be a better Judge of the falſe Opinions which have been entertained and advanced concerning this Diſorder by the principal Writers in Surgery, we ſhall endeavour briefly to relate them: And, firſt, ſome of them have by the Name of *Fiſtula lacrymalis* underſtood that kind of Diſorder which we term *Epiphora*, or the watery Eye, and have deſcribed in the preceding Chapter. (2.) Others ſeem to uſe the Terms *Fiſtula lacrymalis*, *Anchylops* and *Aegilops*, as ſynonymous; ſo that there is no poſſibility of knowing their Meaning, till we are furniſhed with the proper Diſtinction and Explanation of thoſe Diſorders ſeparately For the *Anchylops* is by the generality of the modern Writers uſed to ſignify a Tubercle in the greater *Canthus* of the Eye next the Noſe, whether it be ſeated in or near the lacrymal Sack, or whether it be with or without an Inflammation accompanying it. It ought to be here obſerved, that the *Sacculus lacrymalis*, as well as other Parts, is ſubject to encyſted Tumors, Inflammation, and Abſceſs, and very often to a Diſtenſion or Rupture, now termed a *Hernia lacrymalis*; (ſee *Tab.* XXVI. *Fig.* 10. A B, and *Fig.* 16 and 17.) in which laſt, upon preſſing the Finger on the Tumor, it ſubſides more or leſs, and the ſerous Humour diſcharges itſelf either through the *Puncta lacrymalia* at the Eye, or into the Cavity of the Noſe, or both Ways. We define an *Aegilops* to be a ſmall Tumor, formed after an Inflammation or Abſceſs, in the greater *Canthus* of the Eye, near the *Sacculus lacrymalis*; which in time, by the Acrimony of its purulent Matter, erodes the external Skin and lacrymal Ducts, ſometimes eats away the Fat round the Globe of the Eye, and ſometimes renders the *Oſſa plana*, and other Bones near the Noſe, *carious* to a dangerous degree. Sometimes the upper, lower, or both of the lacrymal Ducts, are ſo eroded, as to diſcharge large Quantities of purulent Matter through the *Puncta* in the greater *Canthus*; and then it forms the *Fiſtula lacrymalis*, whoſe Characteriſtic is a purulent Matter: But when the diſcharged Humour is quite limpid and aqueous, the Diſorder ought then to be denominated an *Epiphora*, as we obſerved in the preceding Chapter. (See *Fig.* 18. *lit. a* and *b*) From what we have here advanced, I think it will not be difficult for any one to diſtinguiſh the different Diſorders of this Part, which, from their Affinity, are very often confounded by Phyſicians and Surgeons.

The different Names and Kinds of the Diſorder.

[a] FALLOPIUS was perhaps the firſt Anatomiſt that obſerved this, in Tom. II. p. 224. See alſo MORGAGNI *Adverſ. Anat.* VI. 64.

Cauſes. III. An *Anchylops* may proceed from many Cauſes; and, among others, an Inflammation or encyſted Tumor may produce this Diſorder, as well as occaſion a ſimple *Fiſtula lacrymalis*, or an *Aegilops*; yet the firſt ariſes ſtill more frequently from a Relaxation and Diſtenſion of the lacrymal Sack: So that we generally meet with an *Aegilops* and *Fiſtula lacrymalis* fixed in the greater *Canthus* of the Eye at one and the ſame time; which ſeems to ariſe from an Obſtruction of the Paſſage of the Tears, or purulent Matter, into the Noſe: The Conſequence of which muſt be an Extenuation and Tumor of the lacrymal Sack. An *Aegilops* is generally cauſed by a previous Inflammation or Abſceſs, which frequently erode the lacrymal Ducts and the external Skin, and even produce a *Fiſtula lacrymalis* in its worſt degree. But though there are many more Cauſes beſides Inflammation, which may produce a *Fiſtula lacrymalis*, yet there is no Cauſe ſo frequent or immediate as an Exulceration of the lacrymal Sack, or of the adjacent Membranes. But when once the lacrymal Ducts are eroded, the Matter finds an immediate Paſſage into the ſubjacent *Sacculus*, as at *Fig.* 18. A *Fiſtula lacrymalis* may alſo frequently proceed from an Obſtruction of the inferior lacrymal Duct, termed the *Canalis naſalis*, *d d*, *Fig.* 7 and 8. from whatever Cauſe that Obſtruction may ariſe. For no Obſtruction can be formed, without inducing a Stagnation of the Humour, which will therefore become acrid, diſtend the Duct, and either erode, or totally deſtroy its Membranes. And in this manner the Diſorder is frequently occaſioned in many Patients who have had an Inflammation in their Eyes, in the Membranes of their Noſe, or in theſe Ducts themſelves, or when thoſe Parts have been injured by the Small-Pox, as I have frequently obſerved; though it muſt be confeſſed, that the Diſorder ſometimes ariſes ſpontaneouſly, without the Aſſiſtance of any of the before-mentioned Cauſes.

Kinds of the *Fiſtula lacrymalis.* IV. There are various Species of theſe *Fiſtulæ*; the firſt Diſtinction of them is, (1.) Into *perfect* and *imperfect*; the former of which is, when the purulent Matter flows out through an Eroſion of the Skin in the *Canthus*; and the latter, when the Matter is diſcharged through the *Puncta lacrymalia*, the Skin remaining entire; which laſt kind is generally accompanied with a Tumor of the lacrymal Sack. You may have an Idea of the perfect kind, from conſulting *Tab.* XVI. *Fig.* 19. *a*, *b*. Some of theſe *Fiſtulæ* are again diſtinguiſhed into (2.) *Simple* and *Compound*; the laſt of which is when a *Calloſity*, *Caries*, or the like attend. Some again are, (3.) *Mild* and recent; others *old* and *malignant*. (4.) Some *intermitting* and *periodical*, others *continual*. Still more Diſtinctions of the ſeveral Species of this Diſorder may be ſeen in *pag.* 8. of our profeſſed Diſſertation on the Subject in 4^to^ 1716, at *Altorf*. We have ſtill another Diſtinction of theſe *Fiſtulæ* into *true* and *falſe*, made by M. Garengeot: By the *true*, he underſtands an Ulceration of the lacrymal Ducts; and by the *falſe* he intends an Ulceration in the adjacent Parts only, which we term *Aegilops*. Some[a] will have a *Calloſity* eſſentially neceſſary to the Formation of a *Fiſtula lacrymalis*; becauſe a *Callus* is conſtantly found in moſt other *Fiſtulæ*: But this is not the common and received Notion of a *Fiſtula lacrymalis*, as we are taught by the Authorities of Celsus, Fallopius, Cardan, Woolhouse, and Morgagni *Adverſ. Anat.* VI. *p.* 82. and from daily

[a] As Signorottus and Platnerus, in *Diſſ. de Fiſt. lacrymali*, Sect. 1, 2, 3.

Experience.

Experience. M. St. Yves [a], the late famous Oculiſt at *Paris*, aſſerts, that he ſeldom found a *Callus* in theſe *Fiſtulæ*; and I myſelf have obſerved a great many, and thoſe inveterate lacrymal *Fiſtulæ*, which have yet had no Calloſity. There are ſome Surgeons again, who imagine that there never can ariſe a *Fiſtula lacrymalis*, without an Obſtruction of the *Canalis naſalis* at the ſame time, becauſe ſuch an Obſtruction muſt be the Occaſion of the *Fiſtula*; but even this Opinion is without Foundation, as hath been long ago evinced by the Authorities of the beſt Writers, and as I have been frequently aſſured by Experience: For I have often obſerved, and am now acquainted with ſome of theſe *Fiſtulæ*, in which the purulent Matter has a free Exit from the lacrymal Sack through the *Puncta lacrymalia*, if you preſs it with the Finger every Day; and at the ſame time the *Canalis naſalis* appears to be open, becauſe the purulent Matter is alſo diſcharged through it into the Noſe [b].

V. Having in general deſcribed and explained the ſeveral kinds of theſe *Fiſtulæ*, and the Diſorders related to them, we ſhall now proceed to the Signs by which they are diſcovered: And, firſt, you may be pretty well aſſured, that the Patient has a lacrymal *Fiſtula*, if he complains of the Tears being more copious than uſual, and running over his Cheek, and that a Quantity of purulent Matter is found collected in the Eye, in a Morning chiefly; and at the ſame time you obſerve no Appearance of Inflammation; but if you preſs the lacrymal Sack with your Finger, it diſcharges a Quantity of purulent Matter by the *Puncta lacrymalia*. You may judge whether there be any *Caries* from the ill ſmell, and from the livid or blackiſh Colour of the Part, with the Diſcharge of purulent Matter; and eſpecially if the Bone appears bare or eroded to the Eye or Probe, in open *Fiſtulæ*. The Colour of the Matter diſcharged is ſo far from giving a ſure Indication, whether or no the Bone is *carious*, that I have often found it of a good Colour, when at the ſame time the Bone appeared rough and eroded to the Probe; but you may be generally aſſured, there is a *Caries* of the Bone, if the *Fiſtula* has been of very long ſtanding, and diſcharges a large Quantity of Matter. But the Seat of the *Caries* is not always the ſame, being ſometimes in the *Os lacrymale*, ſometimes in the *Os planum*, and in the *Os maxillare ſuperius*. You may diſcover whether the *Canalis naſalis* be obſtructed, from little or none of the purulent Matter, or injected Liquor, being able to make its way into the Noſe, but all returning through one of the *Puncta lacrymalia* [c]. A *Callus* in theſe *Fiſtulæ* may be diſcovered by the unuſual Hardneſs or Reſiſtance which the Parts give to the Finger; but this is not a frequent Symptom in lacrymal *Fiſtulæ*, as hath been often obſerved by St. Yves, M. Garengeot, and myſelf. If theſe Parts are

Signs of the *Fiſtula lacrymalis*.

[a] See his *Traité des Maladies des Yeux*, pag. 59. and Schobingeri *Diſſ. de Fiſtul. lacrym.* p. 3.

[b] Some will have it, that the purulent Matter flows only through the upper, and others only through the lower *Punctum lacrymale*; but it has generally a Paſſage through both, though often more is diſcharged through one than the other.

[c] I obſerved an uncommon Species of the *Fiſtula lacrymalis* here in a Student, *Anno* 1726; in which, though the Diſorder had been of eight Years ſtanding, yet no Matter could be diſcharged by preſſing with the Finger. The Tears conſtantly iſſued down upon his Cheeks, and after Sleep the Eye was found replete with a purulent Matter; but when a Quantity of Liquor was injected at either *Punctum*, it ran out with ſome purulent Matter through the other. There was no Tumor of the lacrymal Sack, but, upon inciſing the Integuments, the lacrymal Bone was found *carious*.

infeſted with an encyſted Tumor, they appear preternaturally enlarged, and harder than uſual, nor does the Tumor ſubſide by preſſing it with the Finger, and there appears no Sign of Inflammation; but if the Tumor ſubſides by Preſſure with the Finger, you may conclude there is a *Hernia lacrymalis*, or Dilatation of the lacrymal Sack. Laſtly, an *Aegilops* is diſcovered by the Appearance of an Exulceration in the greater *Canthus* of the Eye next the Noſe, without affecting the lacrymal Ducts.

Prognoſis. VI. The ſeveral Diſorders before enumerated uſually terminate differently, according to particular Circumſtances; but as the Eye itſelf, and the ſpongy Bones of its Orbit, are ſo nearly ſituated, it is hardly poſſible the Patient ſhould eſcape a *Caries* in the laſt, with many grievous Symptoms in that Organ itſelf. An *Anchylops* or *Aegilops* may very eaſily degenerate into a *Fiſtula*, and a ſlight *Fiſtula* my become obſtinate, malignant, and even cancerous; which having deſtroyed the Bones, there are then but little Hopes of obtaining a Cure. Theſe Diſorders are in general more or leſs malignant, according as the Patient is of a good or bad Habit of Body, as the matter of the *Fiſtula* is more or leſs acrimonious, and as the Patient is more or leſs regular in his Diet and Courſe of Life. If the Patient is in other reſpects well, the Diſorder recent, and without a *Caries*, *Callus*, or other bad Symptoms, there is no great Danger; but the Diſorder may be cured, by the Method of ANELIUS, in a few Days time. The perfect or compleat *Fiſtula* which has eroded through the Skin, is generally attended with a *Caries*, and is therefore hardly, if at all, curable, before the *carious* Bones are removed; alſo a *Callus* muſt be firſt removed, before you can cure thoſe *Fiſtulæ* in which it is found; but if both Calloſity and *Caries* are abſent, a Cure may be obtained with much more Eaſe and Expedition. Again, in general, the older or more inveterate the *Fiſtula*, the more difficult it is to cure; becauſe in them the Bones are commonly infeſted with a *Caries*; and if that is not perfectly removed, though you ſhould in appearance cure the Diſorder, it will quickly return again. But what is more than a little ſurpriſing, there are ſome Surgeons who write, that ſeveral of theſe *Fiſtulæ* which have been accompanied both with a *Callus* and a *Caries*, have been cured barely by leaving the Diſorder to Nature [a]. Unleſs the *Canalis naſalis* be rendered pervious, and kept open, the Cure cannot be compleated; for though you remove the *Callus* and *Caries* by the Knife or Cautery, the Patient will be afterwards troubled with a watery Eye, in which the Tears run down over the Cheeks. The compreſſing Inſtruments formely uſed to relieve this Complaint, do little more than moleſt the Patient, or frequently turn a mild into a malignant *Fiſtula*. But the Practice of the modern Surgeons is greatly to be preferred before that of the Ancients in this Diſorder; for the firſt being reformed by the Authority and Example of ANELIUS, about the Year 1712, have ever ſince continued to cure recent *Fiſtulæ* of this Species after his manner, without either the Uſe of *Scalpel*, Terebra, or Cautery, provided there is no *Callus* or *Caries* in it, notwithſtanding what others may ſay to the contrary; whereas formerly they hardly ever cured a *Fiſtula lacrymalis* of any kind, without the Uſe of one of thoſe ſevere Remedies.

[a] This does but very ſeldom happen. See more in MAITRE-JAN, *in Lib. de Morbis Oculorum, in Cap. de Fiſtulâ lacrymali.*

VII. If

VII. If the Patient is troubled with an *Anchylops*, or Tumor or Inflammation in the greater Angle of the Eye next the Noſe, the Surgeon muſt in that Caſe uſe his Endeavours firſt to diſperſe it, to prevent the Tumor from degenerating into an Abſceſs or *Fiſtula*. This Intention may be beſt anſwered towards the beginning of the Diſorder, by moiſtening the Part with a little *Sp. Vitriol.* by dipping a ſmall Bruſh, or the End of the Finger, therein ſeveral times in a Day, as in treating upon Tumors we directed for the *Furuncle*; but in this Practice you muſt be very careful to avoid injuring the Eye itſelf; upon which account it may, in ſome Caſes, be ſafer to uſe a Liniment of *Mel Roſar.* acidulated with *Sp. Vitriol.* covering the Part afterwards with a *Diachylon* Plaſter. In moſt Caſes, a Cure may be almoſt as readily obtained by frequent fomenting with Compreſſes dipped in warm *Sp. Vini Camph.* and a Cataplaſm *ex Pomis coctis, vel aſſatis Camphorâque miſt.* to be continued till the Tumor ſubſides, and the Inflammation is diſperſed. If the Tumor ſhould appear to be of the encyſted kind, you may treat it as we have directed in Chap. XXVIII. N° VI. and VII. foregoing; by which Method I happily extirpated a large encyſted Tumor by the *Scalpel*, which was very deeply ſituated in the *Orbit* of the Eye of a certain Maid. Laſtly, when the Tumor ariſes from a Diſtenſion of the lacrymal Sack, you muſt treat the Diſorder by the Methods we ſhall preſently direct at N° X. following. Treatment of the *Anchylops.*

VIII. If the laſt mentioned Tumor or Inflammation rather tends to Suppuration than to be diſperſed by the preceding Treatment, it will then be proper to forward its Maturation or Converſion into Matter as much poſſible, leſt an obſtinate *Fiſtula*, or worſe Conſequences, ſhould be the Effects of too long Delay. The Suppuration of it may be conveniently promoted by a *Diachylon* Plaſter with the Gums, or an emollient Cataplaſm frequently applied warm. As ſoon as you can diſcover that the Matter is ſuppurated, you are to open the moſt depending Part of the Tumor, either with a Lancet or *Scalpel*, to diſcharge and preſs out the Matter, that it may not eat through its including Cyſt, or the adjacent thin Bones: That being thus diſcharged, the Abſceſs or Ulcer muſt be next deterged by dreſſing with digeſtive Ointments, or *Mel Roſarum cum Myrrhâ, vel Ung. Aegyptiac. ſeu Præcipitat. rub. Portiunculâ permiſt.* after which it may be healed with vulnerary Balſams, in the manner we directed for Abſceſſes in general. If the Abſceſs in this Diſorder ſhould break of its own accord, as I have frequently known it to do, and its Aperture or Orifice appears too narrow to give a free Diſcharge to the Matter, it may be afterwards dilated with a Tent, prepared Sponge, Gentian Root, or rather by the *Scalpel*, and then treat it as before. If the Bone appears foul, it will be neceſſary to apply ſome ſcraped Lint, with a few Drops of *Sp. Sulph. aut Vitriol.* or a little *Pulv. Euphorb.* laying over it a Compreſs dipped in *Aq. Calcis*; by which means having removed the *Caries*, the Wound will be diſpoſed to heal. Sometimes it will be found neceſſary to exfoliate or ſcrape the foul Bone with the Raſp, repreſented in *Tab.* VII. *Fig.* 3, 4, 5. or *Tab.* XVIII. *Fig.* 9. Some Surgeons think it a more ready Method of Cure, to cauteriſe the Bone with red-hot Irons, adapted to a Tube or Caſe, as in *Tab.* XVI. *Fig.* 21 and 22. compleating the reſt of the Cure with Balſams or vulnerary Medicines, in the manner we ſhall explain more at large in treating of this Diſorder at N° XII. following. Treatment of the *Aegilops.*

IX. The

Treatment of ſlight *Fiſtulæ*.

IX. The Treatment of the true Species of lacrymal *Fiſtulæ*, in which there is an Ulceration of the lacrymal Paſſages, is various, according to the different Nature, Degree, and Circumſtances of the Diſorder. For when the *Fiſtula* is recent, the Patient of a good Habit, the Skin entire, and the Ducts not ulcerated or obſtructed, but diſcharging freely a mucous, and not a purulent Matter into the Noſe, you ought not, in theſe Circumſtances, to have immediate Recourſe to the Knife, Terebra, or Cautery, but firſt endeavour to cure the *Fiſtula* by the mildeſt methods of Treatment, before you try the ſeverer Operations of Surgery; that is, you ought frequently to expreſs the Matter included in the lacrymal Sack by your Fingers, leſt it become ſo acrid, as to erode the adjacent Parts by its too long Stay; and, in the Intervals, you ſhould ſtrive to cleanſe or deterge the Parts by the repeated Uſe of the mundifying Remedies, which we adviſed for the watery Eye in Chap. LIII. N° V. at the ſame time too you muſt call in the Aid of *Phlebotomy*, Purges, Scarification, Bliſters, Diet, and Regimen, according to the Patient's particular Habit and Circumſtances.

Cure by Compreſſion.

X. M. Dionis tells us, in his Surgery, that he has cured many of theſe recent *Fiſtulæ*, particularly in Infants, barely by Compreſſion in a proper manner; and Garengeot alſo affirms the ſame to have been done formerly at *Paris* by the eminent Surgeon M. Arneau. By the firſt of theſe the Compreſſion was made in the following manner: 1. Firſt of all he impoſed a piece of *Emplaſt. deminio* upon the Tubercle or *Fiſtula* of the lacrymal Sack; then, 2. he applied a ſmall triangular Compreſs of about the Thickneſs of one's Finger, or, inſtead of the one thick Compreſs, he impoſed ſeveral thinner ones upon each other, in order to fill up exactly the Cavity in the Angle of the Eye next the Noſe. In the next Place, 3. he adapted another Compreſs over the former, dipping both of them firſt in ſome *Aq. Calc.* or *Sp. Vini*. Laſtly, 4. he firmly ſecured and preſſed down the Compreſſes upon the Tumor by a ſtrict Deligation with a circular Bandage, that, by this means, none of the vitiated Humours might be collected or retained, and that the relaxed *Sacculus* might, by degrees, recover its former Tone and Dimenſions. But, according to M. Dionis, this Treatment muſt be continued for ſeveral entire Months to cure the Patient. It is to be obſerved, that ſome uſe a peculiar Inſtrument for compreſſing the Parts diſordered, inſtead of Compreſſes and Bandage; of which Inſtrument there are ſeveral kinds propoſed by Fabric. ab Aquapendente, Sculetus, Palfyn, and myſelf, in *Tab.* XVI. *Fig.* 20. taken from Platnerus. But, after all, this Method by Compreſſure will be to no purpoſe when the lacrymal Ducts are concreted or obſtructed; for the Advantage of this Practice can only take place when there is an Abſceſs near the lacrymal Sack, as in *Fig.* 18. or at leaſt when the lacrymal Ducts are found pervious.

Cure by Inciſion.

XI. When the Diſorder is become ſo malignant or inveterate as not to be relieved by the preceding Method of Compreſſion, the general Practice of Surgeons in that Caſe was formerly, and now is, to lay open the Tubercle, or diſtended lacrymal Sack almoſt in the middle, betwixt the internal *Canthus* and the Noſe, and this either by Cauſtic, or rather by Inciſion with a *Scalpel* or a Lancet; but with great Circumſpection, to avoid wounding the lacrymal Ducts and *Puncta*, which lead to the Sack, or the Ligament which faſtens one Eyelid to the other, which would greatly deform the Eye. 'Tis generally adviſed to make this Inciſion obliquely; as, for example, from *d* towards *e* or *c*. *Fig.* 9. *Tab.* XVI.

XVI. or in *Fig.* 10. from B towards A; for which ſome prefer the ſtraight, and others the crooked *Scalpel*; but either of them will do, in my Opinion; for I have ſucceſsfully performed the Operation with both. Your Inciſion muſt be continued downward, till you have penetrated into the Cavity of the lacrymal Sack, enlarging it afterwards both upward and downward in the aforeſaid Direction from the top of the Sack down to the *Canalis oſſeus*; the Wound is next to be dilated by filling it with Lint, though PLATNERUS and GARENGEOT recommend a peculiar Inſtrument for this Uſe, and, laſtly, the Dreſſings are to be ſecured with Compreſs and Bandage. There are others again who rather approve of making this Inciſion in a ſemicircular Form like an Arch, whoſe Convexity muſt be towards the Noſe, and Concavity towards the Eye, beginning the Inciſion at the lower Part of the *Apophyſis naſalis* of the *Os frontis*, where that Bone meets the *Os maxillare* and *lacrymale*, continuing your Inciſion from thence, in the Form of an Arch, to the meeting of the internal *Apophyſis* of the *Os jugale*, as we have repreſented by the dotted Line *c b*, *Fig.* 19. *Tab.* XVI. When your Inciſion is ſufficiently enlarged by the Knife, you muſt dilate it further with Lint, as before; by which means you have an Opportunity the next Day of obſerving, whether the Bones be *carious*, and in what Part or Manner it will be beſt to perforate them. If the Wound ſhould bleed much, you may apply a Pledgit of Lint dipt in *Sp. Vini rectificatiſſ.* to be retained on the Part with a Compreſs, and a little ſtricter Bandage. In the ſubſequent Dreſſings you muſt uſe *Eſſent. ſuccin. Ol. later.* and other detergent Applications, as we before directed for the *Aegilops* at N° VIII. and when the Parts are well cleanſed by them, you may finiſh the Cure with ſome vulnerary Balſam and deſiccative Plaſter, retained with a thick triangular Compreſs, as we directed at N° X. and thus the Wound gradually heals. Others again apply the compreſſing Inſtrument before-mentioned upon the Wound over the Compreſs and Plaſter; but not very often with the deſired Succeſs, becauſe the *Canalis naſalis* is generally hereby obſtructed.

The ancient Treatment of a callous *Fiſtula* with *Caries*.

XII. In a callous *Fiſtula lacrymalis* the Method of Treatment uſed by the ancient Surgeons was to open the Ulcer firſt, and then to dreſs it with *Trochiſc. de minio, Pærcipit. rub. Ung. Ægyptiac. Lap. infernal. &c.* with which they removed the Calloſity, and then finiſhed the Cure in the manner we before directed. But if a *Caries* alſo accompanied it, they applied *Pulv. ex Euphorbio*, or *Sp. Sulph. Vitriol. &c.* with ſcraped Lint, and, if theſe did not anſwer, they then raſped or ſcraped the vitiated Bone, as we directed at N° IX. or elſe applied the actual Cautery ſeveral times according as the Caſe required. The cauteriſing Inſtruments uſed in this Diſorder, were of various Figures, as the Surgeon beſt fancied, as you may ſee by thoſe figured in AQUAPENDENS, SCULTETUS, SOLINGEN, PALFYN, DIONIS, GARENGEOT, PLATNER, *&c.* Some were uſed naked without any Tube, as thoſe we have repreſented in our *Tab.* III. *Fig.* 14 and 16. others again were furniſhed with a Tube, which was firſt placed in the Wound cloſe to the Bone, and then the Cautery was conveyed through it, to avoid burning the Skin and Lips of the Wound; ſee *Tab.* XVI. *Fig.* 21, 22. The Eſchars formed by the Cautery were afterwards ſeparated by ſome digeſtive Ointment, and the Wound then healed with vulnerary Balſams, as we directed before. But in performing this Operation you ſhould firſt not only bind up the Patient's ſound Eye, that he may not be terrified at the Sight of the Cautery, but

but you ſhould alſo ſecure the diſordered Eye by an Inſtrument in the Shape of a Spoon, *Tab.* XVI. *Fig.* 23. that it may not be touched by the Cautery. It will be alſo previouſly neceſſary to dry the Bone well with Lint before you apply the Cautery, which will otherwiſe be too ſoon extinguiſhed. But, after all, this Treatment, in order to cleanſe the *Fiſtula* by the Cautery, will be to little or no purpoſe, ſo long as the *Canalis naſalis* remains obſtructed. Nor can the Tears be diſcharged into the Noſe without a new Paſſage be made for them by perforating the Bones with the Cautery, otherwiſe the Patient will be continually moleſted with a watery Eye after the *Fiſtula* is cured; ſo that this Method of Cure will, in my Opinion, ſucceed beſt when the *Canalis naſalis* remains pervious and entire, or when there is a Suppuration without-ſide the lacrymal Sack; and therefore it will be highly neceſſary to diſtinguiſh thoſe *Fiſtulæ*, in which the *Canalis naſalis* is occluded, or ſhut up, from thoſe in which it is not.

Cure by perforating the *Os lacrymale.*

XIII. To remove the laſt mentioned Symptom, the watery Eye, in the Cure of theſe *Fiſtulæ*, ſome Surgeons have propoſed the following Method, *viz.* after opening the lacrymal Sack, as we directed before at N° XI. the next Day they perforated the *Os Unguis* with a ſharp-pointed Inſtrument for the purpoſe, (*Tab.* XVI. *Fig.* 24. or *Tab.* VII. *Fig.* 7. or *Tab.* XXIV. *Fig.* 2.) which is carefully paſſed obliquely through the upper and lower Part of the *Os ſpongioſum* into the Cavity of the Noſe, after which they introduce and leave a ſmall Tent in the Wound, which is frequently cleared and opened with a Probe, till, being healed, it forms an artificial lacrymal Duct. Some remove the *Caries*, and make an artificial lacrymal Duct at the ſame time by the fore-mentioned Inſtruments, or by a Director, without any actual Cautery; which laſt is, however, uſed by ſome like that at *Fig.* 21. with the Tube *Fig.* 22. with which the Bones are perforated, and a Paſſage made for the Tears into the Noſe as before. Though theſe Methods of Cure are very troubleſome and painful to the Patient, yet they are at preſent uſed as the beſt we are acquainted with; and St. Yves, the famous Oculiſt of *Paris*, treated his Patients in the ſame Method, as he informs us in his Treatiſe on *Diſorders of the Eyes.*

Anelius's new Method of curing lacrymal *Fiſtulæ.*

XIV. But, in Conſideration of the great Difficulty there is to perſuade grand and timorous Patients, to undergo the Severity and Fatigue of the fore-mentioned Operations of Inciſion, Boring, Cauteriſing, &c. Anelius, in the Year 1712, endeavoured to contrive a more ſafe and eaſy Method of curing theſe *Fiſtulæ*, in Favour of the Duke of *Savoy*, who was then troubled with the Diſorder. Which Method ſucceeded ſo well, as to cure not only recent, but even inveterate *Fiſtulæ*, when accompanied with *Callus* or *Caries*, and that even without the Severity of the Knife, Cautery, or Compreſſion, in the following manner:

The Uſe of Anelius's Probe.

XV. He firſt provided himſelf with a ſlender Probe, in the Form of an Arch, made of ſmall ſilver-wire, as in *Tab.* XVI. *Fig.* 11, 12, 13. then placing the Patient in a convenient Poſture againſt the Light, he opens the Eyelids with the Fingers of one Hand, while with thoſe of the other he introduces the crooked Probe through the upper *Punctum lacrymale* into the Sack, which may be done with more or leſs Difficulty, according as the Surgeon has before conſidered the Figure, or Poſition, and anatomical Structure of the Parts. After having introduced the Probe into the Sack, he gently agitates and preſſes it downwards,

wards, and towards the Noſe, with a certain Slight into the obſtructed *Canalis naſalis*, which is by this means opened. Theſe Ducts are much more eaſily opened by this Artifice, when they are only obſtructed by Matter, or ſome glutinous Humour, than when they are totally cloſed or concreted, as is frequently obſerved in theſe *Fiſtulæ* which are inveterate; for the laſt ſometimes require the Probe to be preſſed into them ſo forcibly, as to excite ſome Pain, and often ſet the Noſe a bleeding a little [a]. But to prevent the newly-opened Duct from cloſing again, M. ANELE thinks it neceſſary to inject ſome Liquor every Night and Morning, or oftener, and then to repeat the Intruduction of the Probe as often as it may be found neceſſary, till no more Matter iſſues from the *Puncta lacrymalia*, which denotes the Ulcer to be cleanſed, and the Ducts to have recovered their natural State.

XVI. To inject theſe Parts, I muſt recommend the Syringe contrived by ANELIUS, and repreſented in *Tab.* XVI. *Fig.* 14. or elſe ſome other like it. The Tube A in the anterior Part of this Inſtrument, is about the Thickneſs of a Hog's Briſtle, and is to be inſerted into the *Punctum lacrymale* of the lower Eyelid, as being leſs moveable, in which manner you force the healing Injection ſeveral times into and through the lacrymal Sack, in order to waſh out the *Sordes*, and render the Ducts pervious [b]. To perform this Operation the more eaſily, your Patient ought to be placed againſt the Light, with his Head either erect, or a little inclined backward; and, if the Diſorder be in the right Eye, the Surgeon ſhould ſtand on the right Side of the Patient, and having filled the Syringe with a ſuitable Injection, he then places his left Ring-finger under the *Punctum lacrymale* of the lower Eyelid near the lacrymal Sack, and thereby draws down the Eyelid, to bring the *Punctum lacrymale* into View, and thus he more eaſily inſerts the Tube of the Syringe, and at the ſame time his Finger ſerves as a *Fulcrum*, or Support to the others which move the Syringe. Having, in this manner, ſecured the Eyelid, the Surgeon next takes the Syringe by its Hinder-part C, betwixt the fore and middle Finger of his right Hand, and carefully inſerts the Tube A, in the lower End of the Syringe D, into the lower *Punctum lacrymale*, after which he preſſes the Handle of the Sucker B into the Syringe by the Thumb of the ſame Hand, ſo as to force the Liquor through the lacrymal Duct, Sack, and *Canalis naſalis* into the Noſe, from whence it will run into the *Fauces*, and ſome Part of it will eſcape through the upper *Punctum lacrymale*. If the Diſorder be in the left Eye, the Surgeon muſt then ſtand on the right Side of the Patient, and manage the reſt of his Operation as before. If the Surgeon pleaſes he may, for Variety, inſert his Syringe, and inject by the upper *Punctum lacrymale*, after having turned it outward and upward by his Finger; but to inject by either of them as he ought, he ſhould be provided with good ſharp Eyes, and a dexterous Hand; though he will find it the moſt eaſy of the two, to inject by the lower *Punctum lacrymale*.

Uſe of M. ANELE's Syringe.

XVII. Theſe two Operatations of probing and injecting muſt be continued, or repeated every Day till you find, 1. that the Injection will paſs freely into

What more muſt be done.

[a] M. GARENGEOT appears to be ignorant of the Uſe of theſe Probes, when he thinks they cannot open the Ducts, but only ſerve to ſearch out the lacrymal Sack; ſee N° XXV. following.

[b] M. GARENGEOT (in Cap. *de Fiſt. lacrym.*) adviſes the Tube of the Syringe to be agitated, till you have introduced it into the lacrymal Sack; but this is not neceſſary; it is ſufficient you inſert it into the *Punctum lacrymale*, or the Beginning of the Duct.

the Noſe without the Aſſiſtance of the Probe; and, 2. that there is no purulent Matter diſcharged either ſpontaneouſly, or by Preſſure from the lacrymal Sack into the greater *Canthus* of the Eye. And then you may conclude, from the two mentioned Circumſtances, that the Cure is compleated, which however is not always performed within the ſame time, but ſooner or later according to the Nature and Degree of the Diſorder, which when mild is ſometimes cured within four, eight, fourteen, or twenty Days, and ſometimes longer; but there is hardly any lacrymal *Fiſtula* ſo bad, but it may by this means be cured in Time, provided it be free from *Callus* and *Caries*. I have myſelf often cured theſe *Fiſtulæ* in ſo ſhort a ſpace as three Days by this Practice; and have even found by Experience, that this method of ANELIUS will not prove altogether unſucceſsful, even in thoſe *Fiſtulæ* which have a ſlight *Caries*. By this method I cured a Girl of ten Years old, in the Year 1727, of an inveterate *Fiſtula lacrymalis*, with a ſlight *Caries*, which I injected every Day for ſix Months, the Patient being at this Day well and married.

Treatment of compleat or open *Fiſtulæ*.

XVIII. In the perfect or compleat Species of the *Fiſtula lacrymalis*, in which the external Skin is eroded or ulcerated, you may much more eaſily open the Paſſage of the occluded naſal Canal, than in the other kind. For in this Diſorder you may readily paſs the fore-mentioned Probe of ANELIUS, immediately through the *Canalis naſalis* right down into the Noſe, and that even with its largeſt End foremoſt, marked *b*, in *Fig.* 12. I have even ſeveral times opened the naſal Canal readily in this Species of the Diſorder, by the Probe marked K in *Tab.* I. and then, for deterging the Ulcer, and compleating the Cure, you muſt follow the methods we have before propoſed; only inſtead of a Tent of Lint, you ſhould uſe one of Lead or Wax, and touch the *Canalis naſalis* every other Day cautiouſly with a conical bit of *Lapis infernalis*, and, after healing up the external Lips of the Wound, uſe the Injections adapted to keep open the naſal Canal for a conſiderable time. M. PETIT has ſometimes ſucceſsfully uſed a thick waxed Thread, to keep open the naſal Canal, inſtead of a Tent, as we are informed by M. GARENGEOT in his Chapter on this Diſorder. But when you find the *Os Unguis* foul or vitiated, you muſt enlarge the opening of your Ulcer, and remove the *Caries*, or perforate the Bone, as we before propoſed.

Fiſtulæ without Obſtruction of the naſal Canal.

XIX. In thoſe lacrymal *Fiſtulæ*, which have no Obſtruction of the naſal Canal, inſtead of probing, you muſt more frequently waſh out the offending *Sordes* by Injection; and when you perceive the lacrymal Sack too much relaxed or diſtended, you muſt endeavour to recover its Tone by topical Remedies, and by Compreſſion with the Inſtrument repreſented in *Tab.* XVI. *Fig.* 20. or ſome other figured for the ſame purpoſe by AQUAPENDENS, SCULTETUS, or PALEYN.

Callous and carious *Fiſtulæ*.

XX. But it muſt not be imagined, that the method of probing and injecting contrived by ANELIUS will cure all lacrymal *Fiſtulæ* whatever; for in ſuch as are inveterate, and attended with an obdurate *Callus*, or a ſpreading *Caries*, this Practice will be to no purpoſe. Nor are we as yet furniſhed with Remedies ſufficient for the Cure of ſuch *Fiſtulæ*; though I can acquaint you, that Archiater BRUNNERUS aſſures me in a Letter, that he cured a lacrymal *Fiſtula* of the very worſt kind by a mercurial Injection. It very often happens too, that the Flux of purulent Matter in this Diſorder cannot be leſſened, nor the naſal

naſal Canal kept open by Injection, ſo as to make a Paſſage into the Noſe, even though it may ſeem pervious to the Probe, of which I have known various Inſtances, without being able to account for the Cauſe. In theſe Caſes therefore, if the Patient preſſes for a Cure, there remains but one method of relieving him, and that is, by removing the *Callus* and *Caries*, and by making a new Paſſage, or an artificial naſal Canal into the Noſe; See N° XII. and XIII. preceding. Sometimes the *Caries* penetrates ſo far into the *Oſſa ſpongioſa* of the Noſe, that it is impoſſible for you to extirpate the ſame either by Remedies or the Cautery; though, I muſt confeſs this to be a Caſe that never occurred in my own Practice. But even in the very worſt Caſes, the Diſorder may be palliated, and the Patient much relieved by making a Paſſage for the purulent Matter, to run into the Noſe, which before diſcharged itſelf with great Uneaſineſs at the Corner of his Eye; and in theſe Caſes too you will find Injections of the greateſt Service.

Other new methods of Cure.

XXI. We before obſerved, that, in imperfect *Fiſtulæ*, where the Skin is not eroded, you ought firſt to make an Inciſion through the Integuments before you perforate the *Os Unguis*. But, to render the Operation leſs formidable and ſevere, a certain Surgeon of *Hamburg* thought it proper to perforate the Skin, *Sacculus*, and Bone at once, with an Inſtrument contrived for that purpoſe, repreſented in *Tab.* XVI. *Fig.* 24. keeping open the new-formed lacrymal Duct by a Tent, till the Wound was healed externally. Laſtly, as ſome of the Moderns have found, that the new naſal Canal formed by perforating the *Os Unguis*, does frequently fill up, or grow together, they have endeavoured to prevent it by inſerting a ſmall Tube of Lead, Silver, or Gold, *Tab.* XVI. *Fig.* 25. which is left there ever after, and the external Wound healed up over it, that the Paſſage may not afterwards cloſe up, and, in this Practice I have ſeveral times ſucceeded myſelf; but then I uſed a Tube a little larger than the common, as at *Fig.* 26. that the Tears might have a free Paſſage, healing up the Wound afterwards over the Tube.

Lemoriere's method.

XXII. We have ſtill another new method of curing lacrymal *Fiſtulæ* propoſed to the Royal Academy at *Paris* by M. Lemoriere [a], who firſt opens the lacrymal Sack in the uſual manner by a *Scalpel*, and then inſerts a particular kind of ſharp-pointed and crooked *Forceps*, *Tab.* XVI. *Fig.* 29 A, with the Beak of which he breaks through the *Os lacrymale* into the Cavity of the Noſe. In the next Place, he dilates the Perforation with the *Forceps*, *Fig.* 30. with which he farther lacerates and breaks the *Os lacrymale*, and Membrane of the Noſe, to enlarge the Ducts, ſo that it may not eaſily cloſe up again, which it is otherwiſe very apt to do. After removing the *Forceps*, he dreſſes the Wound for the firſt Days with Lint, and ſome digeſtive Ointment; but, on the third or fourth Day, he introduces a bit of Wax-candle into the new-formed Duct inſtead of a Tent, which ſhould be about the Thickneſs of a Straw, or one line at leaſt in Diameter, made a little crooked, and armed with a ſmall Head, as at *Fig.* 31. A, B. This he continues in the Duct for the ſpace of thirty or forty Days, till the Parts are well formed, after which he removes the Candle, and heals the Wound; by which method, he aſſerts, the Duct may be certainly kept open without any Danger of Concretions.

[a] In *Memor. Acad. Reg.* An. 1729. *pag.* 250. Edit. *Amſtel.*

M. St. Yves's method.

XXIII. We have alſo another method of curing theſe *Fiſtulæ* given us by the famous Oculiſt St. Yves of *Paris*, and deſcribed by Schobingerus in a Treatiſe *De Fiſtulâ lacrymali*, *Baſil. An.* 1730. as follows: Firſt he gently elevates and ſtretches the Skin at the greater *Canthus* of the Eye, as in opening a Vein, and then makes an oblique Inciſion with a Lancet, through the Integuments and lacrymal Sack from the Eyelids towards the Tendon of their orbicular Muſcle [b], he next dilates the Wound by inſerting a Tent of prepared Sponge, and defends it with a piece of Plaſter. The next Day, after removing the Dreſſings, he examines the State of the Wound and *Os Unguis* with a Probe, and by Injection, and is particularly careful in his Enquiry, whether the Bone be *carious*; this done, he ſupports the Patient's Head in a reclined Poſture with one Hand, while, with the other, he cautiouſly and obliquely perforates the *Os Unguis* towards the Noſe with a kind of Trocar; in doing of which great Care muſt be taken not to miſtake the *Os planum* for the *Os Unguis*, leſt, by perforating the firſt, you ſhould run into the *Antrum Highmorianum*, or elſe upon the *Apophyſis naſalis* of the *Os maxillare*. Add to this, that when the Apex of the Trocar has entered obliquely through the *Os Unguis*, you muſt then direct it betwixt the two *Laminæ* of the *Os ſpongioſum* in the middle of the Noſe, that you may avoid injuring thoſe *Laminæ*, or any of the adjacent Parts. The Perforation thus made, the Surgeon now directs the Patient to breath deep, and blow out the Air forcibly through his Noſe, that, by the Exit of the Air and Blood through the Wound, he may judge whether the Perforation be rightly made. To dilate and keep the Paſſage open, he at firſt inſerts a bit of Wood like a Wedge, and covers it with a bit of Plaſter; but, for the ſame purpoſe, he afterwards dreſſes with Tents of Lint dipt in Cerate, which Tents he renews every third Day, gradually enlarging them, but never exceeds the Thickneſs of a Gooſequill, and afterwards he gradually diminiſhes the Thickneſs of the Tents before the Wound is quite healed [c], by which means he aſſerts, that the foul Bones will caſt off and ſeparate ſpontaneouſly, without the help either of actual or potential Cautery, and a new Paſſage will be formed for the Tears from the lacrymal Sack to the Noſe. If any Splinters or Aſperities of Bones offer themſelves in the Cure, they muſt be removed, Sinuoſities muſt be opened, and Ulcerations in the *Membrana Schneideriana* and lacrymal Sack deterged with *Lap. infernal.* or other Eſcharotics. At every Dreſſing the Patient muſt cloſe his Noſtrils, and endeavour to force the Air through the new-formed Duct, to diſcharge the *Sordes*, and clear the Paſſage, which muſt be afterwards filled with a Tent dipt in Oil [d], and covered with a Plaſter, and when the Sides of this artificial *Canalis naſalis* appear conſolidated, the Tent is omitted, and the Plaſter only uſed till the external Wound is alſo cicatriſed, which, he ſays, will generally be within the ſpace of ſix or eight Weeks. And, laſtly, towards the End of the Cure, when the Parts are near cicatriſed, you may inject ſome proper Li-

[b] I ſuppoſe the Inciſions muſt be made from below upward: But it does not appear from this Deſcription.

[c] I queſtion whether it be abſolutely neceſſary to obſerve all theſe Circumſtances minutely.

[d] 'Tis the general Advice of Surgeons, never to apply Oil or Fat to injured Bones; and, as I can ſee no Reaſon why it ſhould be applied to theſe tender ones, I think 'tis ſafer to uſe a Tent dipt in *Sp. Vini rect.* or ſome Tincture, rather than Oil.

quor

quor through the *Punctum lacrymale*, which, by paſſing into the Noſe, will demonſtrate whether you have rightly ſucceeded.

XXIV. With regard to the method of curing lacrymal *Fiſtulæ* by probing and injecting, propoſed by ANELIUS, SCHOBINGERUS in *pag.* 22. of his Diſſertation on this Subject, writes, that it is almoſt univerſally rejected, or forgot, becauſe it requires an uncommon Dexterity or ſlight in the Adminiſtration thereof. I grant indeed it may be rejected, or forgot, by thoſe who are ignorant of the *Encheireſis* of the Operation, and Anatomy of the Parts; but, for my own Part, it is my general Practice, and I find no Difficulty in it; though one would imagine, from the Deſcription SCHOBINGERUS gives of it, that he could ſcarce at all perform it, not being ſufficiently verſed in its *Encheireſis*. An Obſervation on the method of ANELIUS.

XXV. 'Tis alſo remarkable, that M. GARENGEOT, in his Operations, paſſes by this method of ANELIUS with little or no mention of it, as a thing of no conſequence; and, in his Treatiſe of Inſtruments, he deſcribes it ſo lamely, that one may be ſatisfied he never attempted or performed it. The Probe too, which he figures for this Operation, is ſo ſlender and weak, and ſo ill-ſhaped towards its upper End, that one can never be able to open the naſal Canal by it. He likewiſe repreſents the End of the Tube for the Syringe to be ſo ſlender, that it muſt be impoſſible for it to have any Perforation or Cavity as it ought; beſides which it will be apt, like a Needle, to run into the Eyelid itſelf inſtead of the Duct. Laſtly, he directs to uſe a *Speculum Oculi*, inſtead of the Fingers to ſecure the Eyelids in this Operation, which *Speculum* he figures double, ſo that the Operator will be more obſtructed than aſſiſted by the Inſtrument, when the whole Buſineſs may be performed with the greateſt Eaſe by the Fingers only, according to the Directions given by myſelf, and ANELIUS, for above theſe twenty Years paſt, and as I have above a hundred Times performed it. In the next Place, M. GARENGEOT writes, that the lacrymal Probe cannot be conducted into the naſal Canal, becauſe (" *le Detour eſt trop grand*") of the great Incurvation of the Paſſage to it; whereas the Probe may be thus conducted without Difficulty by one verſed in the Artifice, and acquainted with the Courſe of the Ducts; and ſo far is the thing from being almoſt impoſſible, as he aſſerts it to be, that I readily performed it above twenty Years ago, barely after the reading of ANELIUS's Account of it, without ſeeing it done by another. I muſt indeed own, that ſeveral Surgeons have, at times, applied themſelves from *Hamburg*, and other remote Parts, to me at *Helmſtadt*, to inſtruct them in the *Encheireſis* of this Operation, which they before thought impracticable, becauſe they had ſeveral Times miſcarried in it; but after they had been ſhewn the Artifice a few Times by me, they found no Difficulty in performing it themſelves. I had once a Student in Divinity under my Care for a lacrymal *Fiſtula*, who, after having ſeen me paſs the Probe every Day for ſome Time through the *Punctum lacrymale* and naſal Canal into his Noſe, could upon trying eaſily perform the ſame himſelf by looking in a Glaſs, and became at length ſo expert in it, as to paſs it with more Nimbleneſs and Dexterity than I could myſelf; for by that Time you would imagine the Probe entering the lacrymal *Punctum* and Duct, he had ſlipt it alſo inſtantly through the lacrymal Sack and naſal Canal into his Noſe, which Proceſs he would repeat ſeveral Times in an Hour without any Difficulty or Uneaſineſs, and there leave the Probe, to keep the Paſſages open. I have been the more prolix on this Artifice, Some Errors of M. GARENGEOT.

fice, to refute the Impoſſibility of it, and demonſtrate M. Garengeot not only unſkilled in the Operation, but even ignorant of the chief Uſe of the Probes which he repreſents, when he ſays they ſerve only to ſearch out the lacrymal Sack; when the chief Deſign of them is to open the obſtructed Cavity of the naſal Canal, in the watery Eye and lacrymal *Fiſtula*. Nor does the aforeſaid Gentleman ſo much as mention the Name of Anelius, the Inventor of theſe lacrymal Probes and Syringe; for what Reaſon I muſt leave others to judge. Conſult Morgagni in *Adverſar. Anatom.* VI. 64.

Authors divided as to the Treatment of theſe *Fiſtulæ*.

XXVI. From what has been ſaid in this Chapter, it will manifeſtly appear, that there are various methods of treating lacrymal *Fiſtulæ*, according to different Authors, and the ſeveral Species of the Diſorder; inſomuch that there is not any one Operation in Surgery beſides, in which Surgeons are leſs uniform or more unſettled in their Practice. You will find this Diſorder conſidered more largely, with many other different, but leſs conſiderable methods of treating it, in our profeſſed Diſſertation *De Fiſtulâ lacrymali*, *Altorf. An.* 1716.

The Author's method of treating lacrymal *Fiſtulæ*.

XXVII. It now remains for me to acquaint the Reader briefly with the methods in which I myſelf uſually treat theſe *Fiſtulæ*. And firſt, in the beginning of the milder Species, I approve of the method of probing and injecting contrived by Anelius, which I uſually continue for the ſpace of ſeveral Days or Weeks, according to the Nature of the Diſorder, and eſpecially when I perceive it diminiſh by this Practice; but when I find little Benefit reſult from it, I have recourſe to the Knife, with which I carefully lay open the Skin and lacrymal Sack by an oblique or ſemi-lunar Inciſion; then waiting till the Hæmorrhage ceaſes, the next Day I perforate the *Os Unguis* into the Noſe, by the Inſtrument for this Purpoſe in *Tab.* XVI. *Fig.* 24. or *Tab.* XXIV. *Fig.* 2. In performing which, I obſerve the ſeveral neceſſary Circumſtances, as I have before directed. After waſhing the Wound with warm Wine, I firſt fill the new-formed Duct with a Tent, and afterwards with a Piece of Wax Candle, or a Leaden Plummit, about the Thickneſs of the Inſtrument at *Fig.* 21. A, which I cleanſe and arm every day with ſome Balſam, till the Canal is compleatly formed; to effect which the ſooner, I now and then touch the Surface with a Stick of *Lap. infernal.* after the Tent or Candle is extracted; and in this method I continue three or four Weeks, or longer. I next inſert a ſmall *Cannula* of Lead, Silver, or Gold, *Tab.* XVI. *Fig.* 25. from Platnerus, and heal up the Wound over it; but as the Bore of that *Cannula* often proves too ſmall to tranſmit the viſcid Juices of theſe Parts freely into the Noſe, I generally prefer one that is a little larger, as at *Fig.* 26, which I inſert, and heal up the Wound over it, as before. The Tube thus left in the new-formed naſal Canal, is generally ſo far from being uneaſy to the Patient, that I have known many who could not tell whether the Tube was left in or not, after their Cure was compleated. But to prevent any Obſtructions, or other Accidents towards the end of the Cure, the Day after I have cloſed the Lips of the Wound, I inject ſome *Decoct. Veronicæ* ſeveral times every Day through the *Puncta lacrymalia* by the Syringe of Anelius, that the Tears may have a clear Paſſage to the Tube. I muſt indeed confeſs, that though theſe Tubes will generally very well ſuffice to convey the Humours into the Noſe, yet in ſome malignant *Fiſtulæ*, when the Tubes are not large, they do not anſwer their Intention,

tention, but leave the Patient moleſted with a watery Eye. I never yet uſed the actual Cautery for the Cure of theſe *Fiſtulæ*, and I really think it is hardly ever neceſſary, notwithſtanding many Authors lay ſo great a ſtreſs upon it; but, on the contrary, I imagine the Baſis of the Cure to conſiſt in making an artificial naſal Canal ſufficiently large, by the method here preſcribed; ſo that it may not eaſily be again cloſed or obſtructed. Even if you meet with a *Caries* in the *Os Unguis*, it may be very well removed without the actual Cautery. And laſtly, you may from hence conclude, thoſe perforating Inſtruments and *Cannulæ* which are too ſmall to make an ample Paſſage through the *Os Unguis* into the Noſe, not well adapted to ſucceed in this Operation.

Cautions.

XXVIII. I think it will not be improper to cloſe this Chapter, by giving the young Surgeon a few Cautions with regard to our preſent Subject: And firſt, it will be neceſſary for him to keep the Patient's Body open with lenient Purges, eſpecially when he is to call in the Aſſiſtance of the Knife, not neglecting to open a Vein in plethoric Subjects, and to repeat it upon the approach of inflammatory Symptoms after the Operation. 2. In Patients of an ill Habit, afflicted with theſe *Fiſtulæ*, the Juices muſt be corrected by the Uſe of alterant and evacuating Medicines before and after the Operation, eſpecially a Decoction of the Woods, and a mercurial Purge now and then. (3.) If the lacrymal *Fiſtula* be attended with ſome other Diſorder, a Regard muſt be had to treat the latter with proper Medicines ſeparately. (4.) With regard to the Surgeon's Poſture for performing this Operation, I uſually do it ſtanding; but PLATNERUS performs it ſitting, almoſt in the manner of couching a Cataract. *Diſſ. de Fiſt. lacrym.* pag. 41. (5.) The ſame Author directs (*pag.* 43.) to remove the *Perioſteum* from the Bone in this Operation, alſo to divide and extirpate the lacrymal Sack by a tranſverſe Inciſion, after ſeparating it from the *Os Unguis*; but as I can ſee no Reaſon for this Practice, I never came into it, and yet I cured my Patients equally well; and therefore of two Evils, the leaſt is to be choſen. (6.) In order to cure a *Hernia* of the lacrymal Sack, PLATNERUS adviſes to open it with the *Scalpel*, and afterwards to heal it with *Balſ. de Mechâ*, that the Sack may be contracted, and rendered firmer by the Cicatrix. I myſelf have ſucceeded in this Practice; but then, a few Days after the Inciſion, I touched the Lips of the Wound every Day with *Lapis infernalis*, and injected afterwards a Decoction of *Veronica cum pauxillo Sp. Vini.* (7.) In a *Caries* of the *Os Unguis*, PLATNERUS adviſes not to perforate it, but to burn it through into the Noſe by the actual Cautery, according to the ancient Practice: But as this ſevere Practice is not attended with any Advantage, and as the *Caries* of the Bone may be removed by perforating it, without Fire, I prefer the mildeſt method. (8.) In cutting theſe *Fiſtulæ*, M. GARENGEOT adviſes to divide the *obliquus inferior* Muſcle of the Eye, if it appears bare of its Fat; but as he gives no Reaſon for this Practice, which may be followed with dangerous Conſequences to the Eye, I think it ought to be rejected. (9.) The ſame Author aſſerts, that the new Perforation into the Noſe cannot be kept open, and that therefore the Tears will not have a Paſſage thither after the Operation; alſo that the *Puncta lacrymalia* will be uſeleſs after the Operation: But if this be compared with what has been here advanced, and tried by the Experience of myſelf and others, the Reader muſt naturally conclude that Gentleman to be but little verſed in Diſorders of the Eyes, which is alſo

argued

argued from his not mentioning what has been propoſed on this Subject by ST. YVES, WOOLHOUSE, and LEMORIERE.

An EXPLANATION *of the* SIXTEENTH PLATE.

Fig. 1. Repreſents an obtuſe pointed Hook, to draw the Eyelids aſunder in ſome Operations: It was ſent me under the *French* Name *Hamſon plat*, or the flat Hook. A is the flat End, B the Handle.

Fig. 2. Repreſents the Needle fixed in a Handle, for elevating and diſſecting the ſmall Blood-veſſels on the *Conjunctiva* and white of the Eye; as alſo to elevate and diſſect a *Pterygium*.

Fig. 3. Denotes a Beard of Rye or Barley, to make the Bruſh or Scarificator, in which A denotes the ſmall Hooks and Points which ſcarify the Blood-veſſels of the Eye.

Fig. 4. Is an Eye-bruſh compoſed of twelve or fifteen of the foregoing Beards; A the Handle, B the Part which ſcarifies.

Fig. 5. Is the Eye-raſp of CELSUS and AEGINETA, made in Shape almoſt like a Spoon, A the Handle, B the rough and convex Part, with which the Ancients ſcarified the Eyelids. This I received from M. MAUCHART. We have another a little different from this repreſented by PLATNERUS in *Diſſert. de Scarif. Oculor.*

Fig. 6. Repreſents the left Eye, whoſe two *Puncta lacrymalia* are denoted by *a a*, and the lacrymal Caruncle betwixt them is marked *b*.

Fig. 7, *and* 8. Exhibit a View of the lacrymal Ducts, as they paſs from each Eye into the Noſe; *a a* the lacrymal Sack, *b b* the *Puncta lacrymalia*, *c c* the Ducts which lead from the two *Puncta* into the Sack, *d d* the naſal Canal, *e e* the Opening of the ſame Canal into the Noſe.

Fig. 9. Shews the manner in which the before deſcribed Ducts are ſituated and diſpoſed with regard to the Eye; *a a* the *Puncta lacrymalia*, *b* the lacrymal Caruncle, *c c* the Ducts which lead from the *Puncta* to the lacrymal Sack, *d* the ſaid *Sacculus*, *e* the *Canalis naſalis*, *f* the Aperture of it into the Noſe.

Fig. 10. Shews an *Anchylops*, and a *Hernia* or Diſtenſion of the lacrymal Sack.

Fig. 11. Is a very ſlender Probe of Silver Wire, a little crooked, and armed with a ſmall Head or round Point, for opening and clearing the lacrymal Ducts and naſal Canal, when they are obſtructed in *Fiſtulæ*, or a watery Eye, as propoſed by ANELIUS.

Fig. 12. Is another Probe of the ſame kind, and for the ſame Uſe, but ſtronger, which I uſe in more obdurate Obſtructions of theſe Parts.

Fig. 13. Is another kind of Probe, which I now uſe for the ſame Intentions, but more conveniently as it is ſhorter.

Fig. 14. Is a ſmall Silver Syringe, to inject Liquors through the *Puncta lacrymalia*, A the Tube which enters the lacrymal *Punctum* and Duct, B the Handle of the Sucker, C, D, the hollow Cylinder.

Fig. 15. Is another ſmall Tube of a different make, which may be adapted to the End of the Syringe by the Screw B.

Fig. 16, *and* 17. Demonſtrate the ſeveral Ways in which the lacrymal Sack may be diſtended or relaxed.

Fig. 18.

Plate 16.

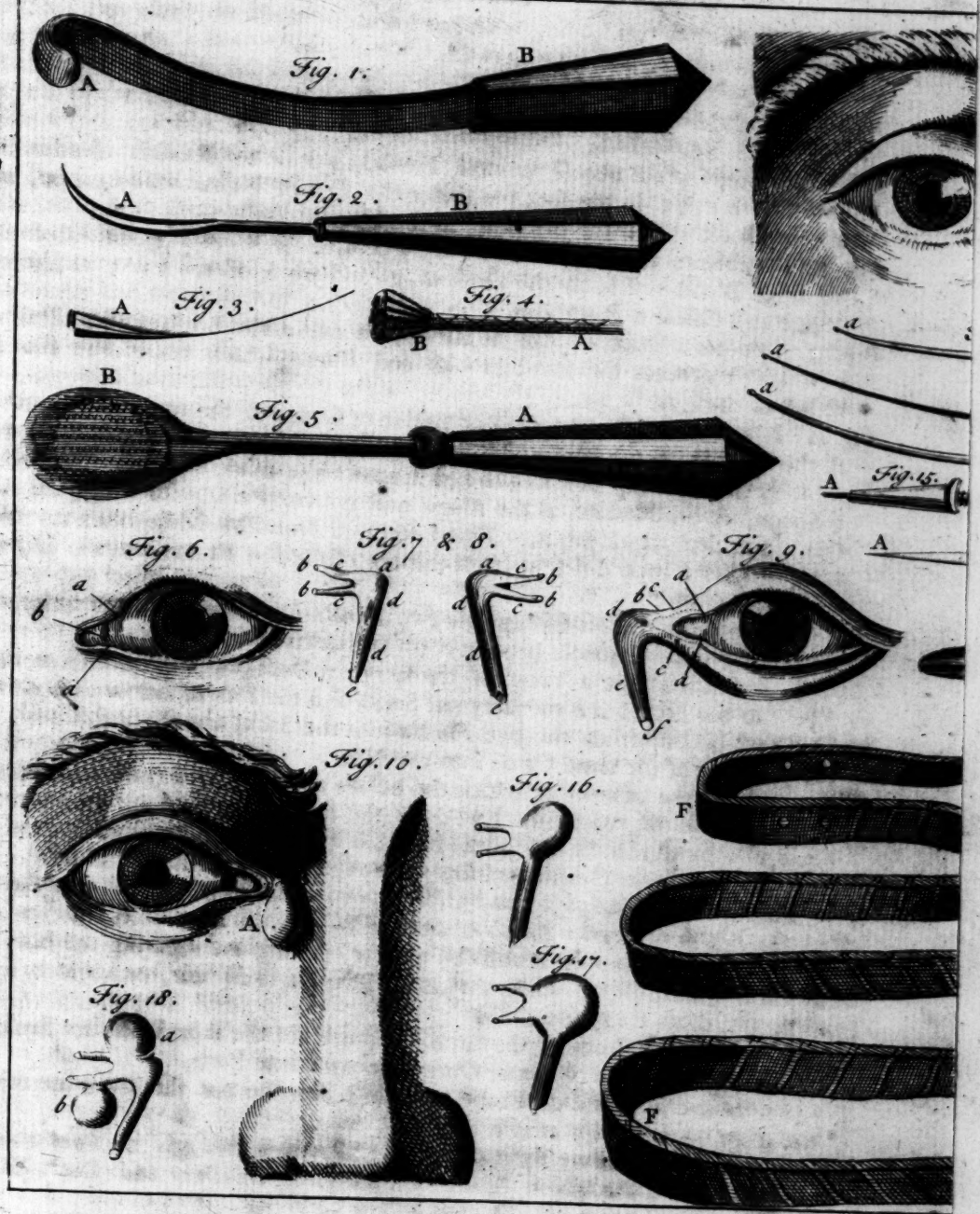
Fig. 1.
A
B
Fig. 2.
A
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Fig. 4.
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Fig. 5.
B
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Fig. 6.
a
b
d
Fig. 7 & 8.
b c a
b c d
d
e
a c b
d c b
d
e
Fig. 9.
a
b c
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Fig. 15.
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Plate 16.

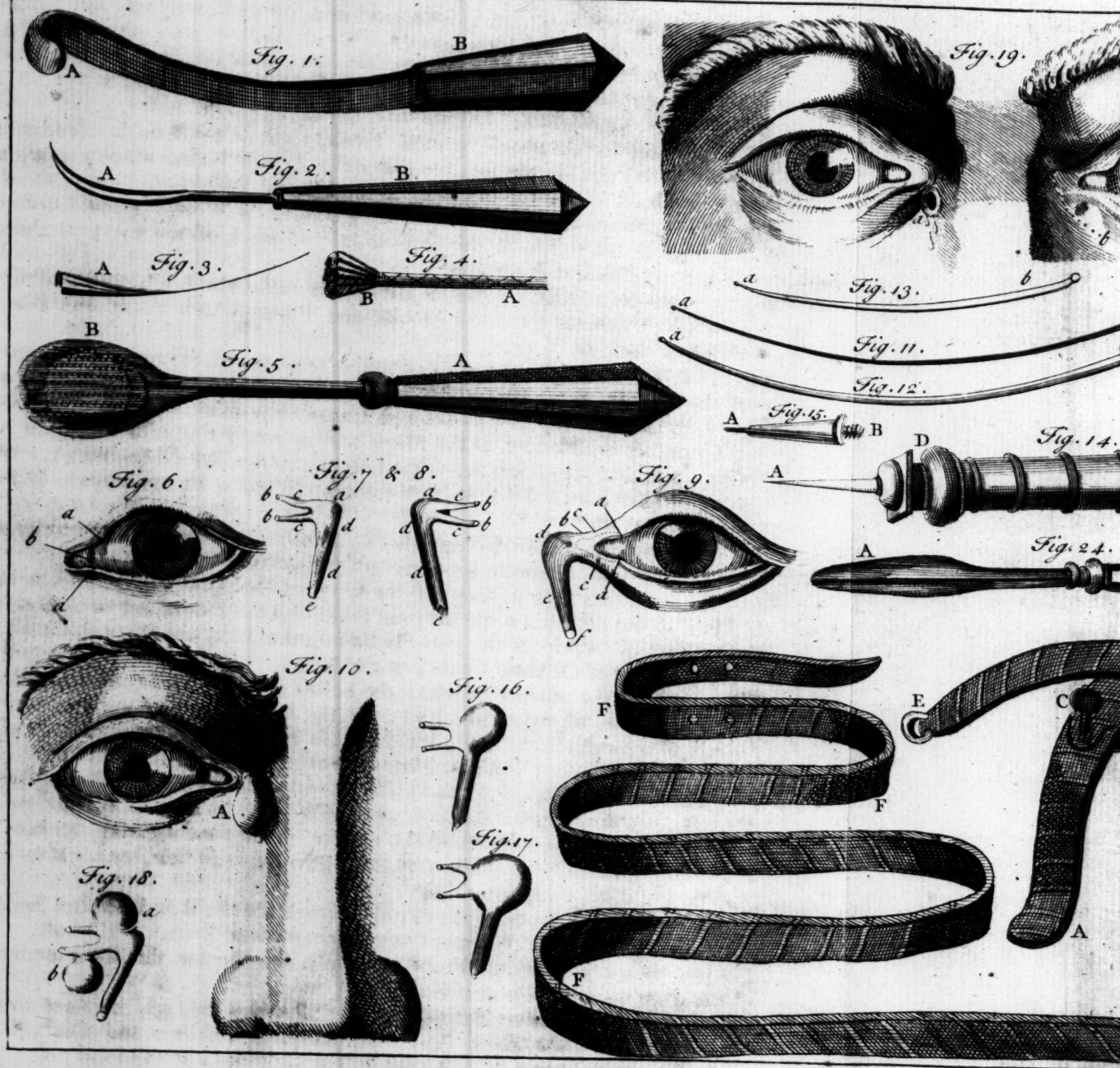
Fig. 1.
A
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a
b
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Fig. 7 & 8.
Fig. 9.
Fig. 10.
A
Fig. 16.
Fig. 17.
Fig. 18.
a
b
Fig. 19.
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Fig. 14.

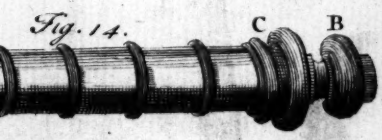

Fig. 24.

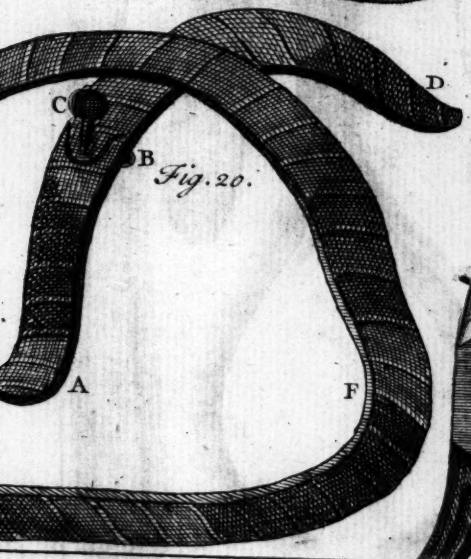

Fig. 20.

Fig. 25.

Fig. 22.

Fig. 21.

Fig. 23.

Fig. 26.

Fig. 27. Fig. 28.

Fig. 31.

Fig. 30.

Fig. 29.

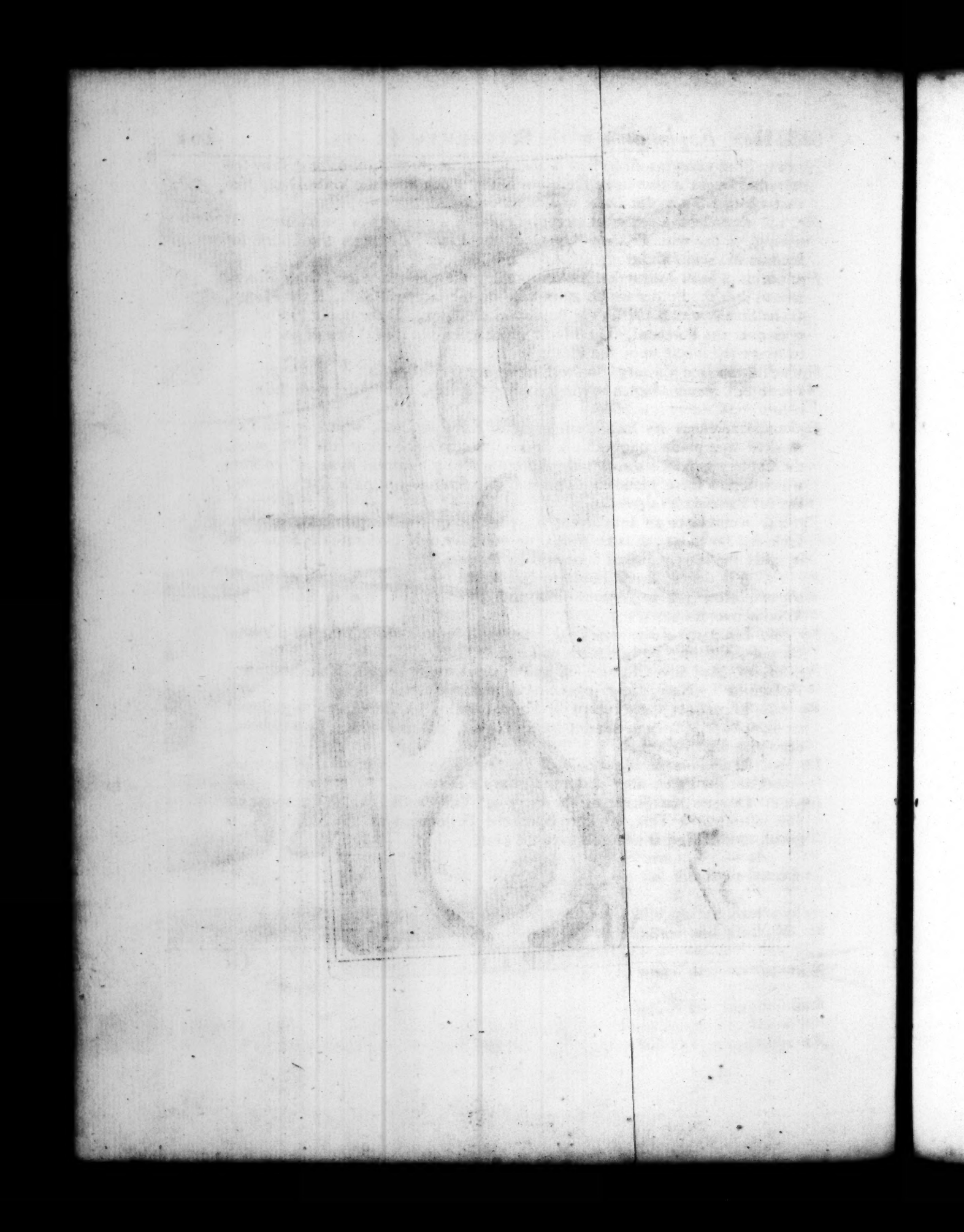

Fig. 18. Shews how an Abſceſs or Tubercle may be formed, ſo as to deſtroy the lacrymal Duct; *a* that upon the upper Duct, *b* one upon the lower Duct, like that which I ſaw in the Duke of *Savoy*.

Fig. 19. Repreſents a compleat lacrymal *Fiſtula*; *a* one with a pretty large Opening, *b* one with a narrow Opening, the Line *b c* denotes the Courſe for Inciſion in theſe *Fiſtulæ*.

Fig. 20. Is a Steel Inſtrument for compreſſing the lacrymal Sack, from PLATNERUS; A the Bolſter which is impoſed on the lacrymal Sack, B the Hinge, C the Screw which preſſes the Bolſter on the Sack, D the upper Part which goes over the Forehead, E a Hook which goes into the Holes of the Strop, to ſecure the whole upon the Head.

Fig. 21. Is an Iron Cautery, for perforating the *Os lacrymale*.

Fig. 22. A *Cannula* adapted to the preceding Cautery, to be fixed upon the Bone before the Cautery is applied.

Fig. 23. Repreſents an Inſtrument made of Silver or Braſs, which in the Part marked *a* is made hollow like a Spoon, to cover and ſecure the Eye, while the Cautery is paſſed through the Aperture *b* to the *carious* Bone, *c* the Part which ſerves for a Handle. This may alſo ſerve to cover the Eye when you cut for the *Fiſtula lacrymalis*.

Fig. 24. Repreſents an Inſtrument for perforating the Integuments, lacrymal Sack and Bone, at the ſame time; or you may only perforate the Bone with it, after the lacrymal Sack is opened by Inciſion.

Fig. 25. A B denote ſmall Tubes to be inſerted into the Perforation of the *Os Unguis*, according to WOOLHOUSE and PLATNERUS, and to heal up the Wound over it.

Fig. 26. Is a Tube of the ſame kind, but a little larger, which I uſe for the ſame Purpoſe, and may be beſt made of Lead or Gold.

Fig. 27, 28. Are Silver Tubes uſed by PLATNERUS, to keep open the new-made Paſſage to the Noſe, till it is become callous or cicatriſed.

Fig. 29. Repreſents the Forceps of LEMORIERE; A the ſharp-pointed and crooked Beak, which perforates the *Os Unguis*, BB its Handles, by which you open and ſhut its Beak.

Fig. 30. Repreſents the Head only of the ſame Forceps, opened as it is when you dilate the Parts, after perforating the *Os lacrymale*.

Fig. 31. Denotes the Shape of the Piece of Wax-Candle, which LEMORIERE uſes inſtead of a Tent, to keep open the Perforation to the Noſe; A its Head, B that End which goes into the Noſe.

Of Operations on the Eyes.

CHAP. LV.

Of Suffuſions or Cataracts.

A *Cataract* deſcribed.

I. AFTER having conſidered the Diſorders of the Parts adjacent, we come now to thoſe of the Eye itſelf; the chief of which is that termed a *Suffuſion* by the Ancients, and a *Cataract* by the Moderns: The *Greeks* call it *Hypochyma* and *Hypochyſis*; the Deſcription of which Diſorder has been very imperfect till of late. We deſcribe a Cataract or Suffuſion, with the generality of Oculiſts, to be a Diſorder of the Humours in the Eye, by which the *Pupilla*, which ought to appear tranſparent and black, looks opake, and of ſome other Colour, as inclining to white, grey, blue, brown, *&c.* by which Viſion is variouſly impeded, or totally deſtroyed.

Cauſes, according to the Ancients.

II. It is remarkable that the generality, and even the moſt eminent Surgeons and Phyſicians, have been all along greatly deceived, till within the preſent Century, both as to the Seat and Cauſes of the Cataract. Moſt of them believed it to be a Pellicle, or membranous Subſtance, formed always in the aqueous Humour; whereas the moſt expert Surgeons and Oculiſts have of late Years found, that, by repeated Diſſections of the Eye thus diſordered, there is hardly ever any white Membrane or other foreign Subſtance to be found in the aqueous Humour, but that it is almoſt conſtantly an Opacity in the cryſtalline Lens: And therefore the true and common Cauſe of a Cataract is, according to myſelf and the reſt of the Moderns, an Opacity of the Cryſtalline, and not any thing in the aqueous Humour, as the Ancients ſuppoſed. Indeed the Ancients might have been led into this Error very eaſily, from the Appearance which the Diſorder affords, without diſſecting the Eye; for by barely inſpecting that diſeaſed Organ, the opake Cryſtalline looks like a Membrane in the aqueous Humour, by couching or depreſſing which with a proper Inſtrument, the Eye recovers its former Viſion. This is confirmed by various Obſervations and Experiments made by ſeveral eminent Members of the Royal Society at *London* and *Paris*, and may be ſeen, conſidered more at large, in our profeſſed Treatiſe *De Cataractâ, Glaucomate, & Amauroſi, Anno* 1713. and in our Apology for, and our Vindication of the ſame, *An.* 1717, and 1719.

The firſt Diſcoverers of the true Cauſe.

III. It is almoſt eighty Years ſince the preceding Error of the Ancients, with regard to the Cauſe of Cataracts, began to be publickly remarked by M. Quare, Rolfinckius, Gassendus, Rauhault, Borelli, and others: But theſe Gentlemen having but few Obſervations to eſtabliſh their truer Notion of the Diſorder, their Obſervations were not only thought, by the generality, to be anomolous, but even the old Error, of Cataracts being conſtantly formed by a Membrane, ſtill prevailed; and the rather, becauſe there were few or none who took the Pains to diſſect any Eyes affected with this Diſeaſe. But at length

length M. BRISSAC and MAITRE-JAN, by new Experiments and Dissections of Eyes thus affected, demonstrated apparently, that Cataracts arose not from any Membrane, but an Opacity of the crystalline Lens [a]. But though these last Gentlemen were much mistaken, in thinking themselves the first Proposers of this Discovery, yet their Merit is not inconsiderable, for having more carefully proved, and demonstrated by incontestable Observations and Experiments what had been started by their Predecessors, and at that time almost buried again in Oblivion. For, to say nothing of myself, the whole Drift of the Essays and Observations on this Subject given us by the Learned in *France*, *England*, and *Italy*, tends largely to prove, that the ordinary and *most common Cause* of Cataracts is from an Opacity of the crystalline Lens.

The Author's Opinion.

IV. I say only the most common Cause of Cataracts is from an Opacity of the Crystalline, without absolutely denying, as some do [b], that a membranous Substance may be sometimes formed in the Eye, so as to cause the like Disorder: I rather recommend this Point to be decided by further Observation and Experiments. For though when I first wrote on the Cataract I was furnished with five Observations of my own, besides those of BRISSAC and MAITRE-JAN, in which an Opacity of the Crystalline appeared to be the sole Cause; yet I even then entertained an Opinion, and afterwards declared it, that I thought a Membrane, or other solid Body, floating in the aqueous Humour, might sometimes also cause a Cataract, as I once observed in dissecting a recent Subject. Nor has this Caution of mine turned out useless to others, since I received a Letter from Professor WIDEMANNUS, Director of the *Acad. Natur. Curiosor.* which assures me, he found and demonstrated such a Membrane to several Physicians of *Norimberg*, in both the Eyes of a Woman who had Cataracts; but then he at the same time observed in one Part of the Crystalline an incipient, and in the other Part a compleat Opacity. After the Operation, which was performed three Years before the Woman died, she became quite blind of that Eye whose Crystalline was wholly opake; and with the other Eye, whose Crystalline began to be obscured, she could only discern and distinguish large Objects. A Case much like this LANCISI tells me he observed in GARELLI, Archiater to the Emperor, upon dissecting whose Eyes he found a whitish Membrane in each, floating in the aqueous Humours; but then here again the Crystallines were yellowish and something obscure, though his Eyes had never undergone any Operation while he lived; so that these Membranes seem generally attended with a Disorder of the Crystalline. From these and a few of the like Observations, it appears, that a Cataract may sometimes be caused by a Membrane in the aqueous Humour, though generally and most frequently from an Opacity of the crystalline Lens.

Assertors of membranous Cataracts refuted.

V. Though an Opacity of the Crystalline Lens appears, from Observation and Experiment, to be the common and most frequent Cause of Cataracts; yet it has been denied by several [c], many of which have no other Reason to offer,

[a] This is the Opinion received and defended by the present *English* Oculist, TAYLOR, in his Pamphlet on the Cataract, *Lond. An.* 1736.

[b] Among these I am reckoned as one by TAYLOR, in Page 5. of his said Pamphlet; but unjustly, since my Writings on the Subject demonstrate the contrary.

[c] We have a Dissertation *De Cataractâ* published in 1721, at *Strasburg*, by FREYTAGIUS; in which

offer, than that they think it very extraordinary, and almoſt impoſſible, that ſo many eminent Phyſicians, and profeſſed Oculiſts, ſhould have been thus miſtaken for ſo many Ages, in judging it to proceed from a Membrane. Others think the Method of curing this Diſorder by couching or depreſſing the cryſtalline Lens, is ſo ſevere and dangerous an Operation, that it muſt inevitably deſtroy the whole Sight of the Eye, becauſe they judge the Cryſtalline to be abſolutely neceſſary for Viſion. But how egregiouſly theſe are miſtaken, may appear from the ſingle Inſtance of the expert Anatomiſt WENCKERUS, who found both the Cryſtallines at the Bottom of the Eyes many Years after he had couched, the Patient in the mean time enjoying his Sight very well, eſpecially with one Eye, even to his Death, when they were diſſected. A like Obſervation we have given us by BENEVOLI, firſt ſeparately, *Florent. Anno* 1722, and afterwards joined to a Treatiſe *de Carunculâ in Urethrâ*; to which add the ſeveral Experiments made by the *French*, mentioned long ago in my Treatiſe on the Cataract. There are ſome again who, being fond of cavilling about Words, contend that ſuch an Opacity of the Cryſtalline ought rather to be called a *Glaucoma* than a *Cataract*; but with no more Reaſon on their Side than the former, ſince this Diſorder of the cryſtalline Lens affords the ſame diagnoſtic Symptoms, and is cured by the ſame Practice with what has all along obtained among the Ancients in their Suffuſion or Cataract; and therefore this Diſorder really is, or at leaſt deſerves the Name of their Cataract. On the contrary, we find that a *Glaucoma* is all along deſcribed by the moſt expert Surgeons and Phyſicians, as a Diſeaſe which very ſeldom happens, and which is wholly incurable. There are other frivolous Objections ſtarted, which the Reader may ſee refuted more at large in our Treatiſe on the Subject, with the Apology for the Vindication of it. We therefore aſſert, that a Cataract is hardly ever cauſed by any Membrane, or other Body floating in the aqueous Humour; becauſe it appears from Experience, that out of fifteen Patients you ſhall hardly find one Cataract cauſed by a Membrane, all the reſt proceeding from an Opacity in the cryſtalline Lens: And conſequently we may depend on what has been advanced by the moſt expert Surgeons in *France*[a], *England*[b], and *Italy*[c]; *viz. that the common Cauſe of Cataracts is not any Membrane, but an Opacity of the Cryſtalline*, notwithſtanding what others may ſay to the contrary.

Diagnoſis. VI. From what has been ſaid, it will be no difficult matter to diſtinguiſh a Cataract from the reſt of the Diſorders of the ſame Organ: For, 1. It differs from an *Amauroſis*, or *Gutta ſerena*, which ſome call the black Cataract, becauſe in this laſt the Eye loſes the Sight without any viſible Diſorder in the Eye, or any Change in the Appearance of its *Pupilla*. 2. An *Albugo*, or white Speck in the Eye, is not behind the *Cornea* and *Uvea*, as is the Cataract,

which he aſſerts the general Cauſe of Cataracts to be a Membrane in the aqueous Humour; but, inſtead of proving it anatomically, he would perſuade us, he had ſeen his Father extract ſuch Membranes with a Hook above an hundred times: But few will believe him, who know any thing of the Diſorder, and what has been advanced concerning it by others.

[a] M. PETIT and M. MORAND, in *Hiſt. Acad. Reg. An.* 1722, 1723, and ST. YVES of *Paris*, in his Book on *Diſeaſes of the Eyes*, Chap. *On the Cataract*.

[b] Mr. CHESELDEN, and others, in *Phil. Tranſact.*

[c] As MORGAGNI, SANTORINI, COCCHUS, BENEVOLUS, &c.

but

but in the *Cornea* itſelf. 3. The *Ungula*, or *Pterygium*, is a preternatural Tunic without-ſide the *Cornea*. 4. The *Hypopium* is indeed ſeated behind the *Cornea* in the aqueous Humour, but then it conſiſts of a purulent and fluctuating Matter; whereas the Cataract is a ſolid Subſtance. 5. A *Glaucoma* does indeed appear in a great meaſure like a Cataract, ſo as to ſeduce many, if they do not conſider that though both of them are ſeated behind the *Pupilla*, yet the *Glaucoma* being in the vitrious Humour, lies deeper than the Cataract, whoſe Seat is in the Cryſtalline; and therefore the firſt will generally appear of a darker blue, or a grey Colour, as its Name imports; whereas the Cataract uſually appears of a Pearl Colour, and ſeated immediately behind the *Pupilla:* Add to this, that it has been conſtantly obſerved by Phyſicians, that the *Glaucoma* very rarely happens in compariſon with the Cataract; and when once it is formed, there is no poſſibility of removing it, which cannot be ſaid of the opake Cryſtalline.

VII. Cataracts have been diſtinguiſhed by Surgeons and Oculiſts into various Species; as, 1. By the Time of their ſtanding into *recent* and *inveterate*. 2. By their Growth into *incipient* and *confirmed*. 3. Into *mature*, when the *Pupilla* is totally obſtructed; and *immature*, when the *Pupilla* being but partly obſcured, the Patient is as yet capable of perceiving Objects. Some Cataracts never come to Maturity, or at leaſt but very ſlowly. 4. According to the Symptoms, Cataracts are again diſtinguiſhed into *ſimple* and *complicated*; the latter being when the *Cornea*, *Uvea*, or vitrious Humour are alſo affected, or when the *Pupilla* is immoveable, too much contracted, or adheres to the adjacent Parts: Sometimes there is a *Tabes* of the Eye attending it, and at other times it is joined with ſome Diſorder of the *Retina*, or optic Nerve. 5. Cataracts are generally immoveable, but ſometimes they tremble or fluctuate upon touching the Eye with the Finger, being then called a *ſhaking Cataract*. 6. Almoſt all of them are of different Shades, though they approach nearly to the ſame Colour, to wit, that of Pearl, whitiſh, or grey, and are accordingly denominated *white* or *grey Cataracts*. We do not frequently meet with Cataracts of a yellow or greeniſh Colour, and ſeldom with any marbled, or looking like Cheeſe, or like a glowing Iron. 7. In ſome Cataracts the cryſtalline Lens degenerates into a milky Fluid, and in others into a purulent Matter, like that of Abſceſſes; and in couching theſe, the Matter will eſcape, and confuſe the Humours of the Eye upon breaking the Capſule of the Cryſtalline with the Needle: And hence again we have a Diſtinction of Cataracts into *milky* and *purulent*. 8. Cataracts are again uſually diſtinguiſhed by Oculiſts into *true* and *ſpurious*; by the firſt we mean one in which the Opacity appears immediately behind the *Pupilla*; and the ſpurious is, when the Opacity ſeems to be ſeated otherwiſe. Laſtly, 9. Cataracts are not undeſervedly diſtinguiſhed into curable and incurable; for thoſe of a grey or whitiſh Colour are the moſt eaſily cured; to which we may add ſuch as have no Colour, the Patient being ſenſible of Light and Darkneſs; alſo thoſe in which the Pupil does not adhere, but can contract and dilate itſelf. On the contrary, you can have no great Hopes of curing complicated or fluctuating Cataracts, in which the Patient can neither perceive Light nor Darkneſs, and in which the Pupil or *Uvea* adheres, is immoveable, and either contracted or dilated; or when it appears of the unuſual Colours at 6. and 7. preceding. We find ſome again diſtinguiſhing Cataracts into *common*

Species of Cataracts.

mon and *uncommon*; by the firſt they intend ſuch Opacities of the Cryſtalline as appear of a whitiſh Colour, and by the laſt they mean thoſe of any other Colour; which indeed differ very remarkably from the former, in appearing not convex, like them, but flat or concave, as we have lately obſerved ſome, and as I find it alſo remarked by the accurate Oculiſt M. St. Yves, in his Treatiſe on the Diſeaſes of this Organ.

Cauſes. VIII. We before demonſtrated, that the common and uſual Cauſe of Cataracts is an Opacity of the cryſtalline Lens, and hardly ever a looſe Membrane: But to explain the Manner in which the Cryſtalline becomes thus obſcured, we muſt conſider, that when the Juices are too thick and glutinous to paſs freely through the very minute ſerous Veſſels of this Body, they ſtagnate and obſtruct thoſe Veſſels, which become afterwards contracted and dried. Thus it may be formed in various inflammatory Diſorders of the Head and Eyes, and particularly after ſome external Violence has injured that Organ, as a Fall, Blow, Burn, *&c.* or expoſing the Eyes too much to the Heat of the Summer-Sun, or an intenſe Fire.

Diagnoſis. IX. The principal Sign of a Cataract is therefore a ſmall Cloud, or whitiſh Opacity of the Cryſtalline; and to ſatisfy your Patient whether it may be cured by couching, you ought to be firſt well aſſured, whether it be of the mature or immature kind; for if it be of the latter, the Operation will be abſolutely miſchievous. The Signs of a *mature* Cataract, fit for couching, are, when the Pupil having loſt its native Blackneſs appears moveable, and equally of a duſky Hue, the Patient being ſenſible of Light and Darkneſs, but incapable of diſtinguiſhing Colours; on the contrary, you may judge it to be *immature*, if the Opacity is not equally ſpread behind the Pupil, the Patient being as yet able to ſee Objects imperfectly, eſpecially upon turning his Back to the Light. But if the Patient can neither diſcern Light nor Darkneſs, it is a Sign the *Retina* or optic Nerve is greatly affected, and that the Diſorder is an *Amauroſis*, or *Gutta ſerena*, for which no Cure can well be expected. You may alſo diſcover whether the Pupil adheres to the Cataract, and is become rigid, by obſerving whether it contracts or dilates itſelf in a ſtrong Light, or in the Dark; alſo if it does not move upon rubbing or touching the Eye with your Finger. If any ſmall Specks appear behind the Pupil, ſome Parts of the Cryſtalline are either inſpiſſated, or elſe ſome minute Pellicles are ſprouting from the *Uvea*, as I remember to have ſeen, and which may poſſibly unite into a Membrane. Sometimes only the Middle, the Margin, or elſe one half of the Cryſtalline is become opake; And, in the firſt Caſe, Objects will ſeem to the Patient to be perforated in the middle. If any Tunic appears plain or convex within-ſide the Pupil, it denotes the Surface of the Cataract, as St. Yves obſerves.

Prognoſis. X. There is ſcarce any Diſorder, the Event of which is more uncertain than that of the Cataract, which will ſometimes admit of a Cure, and ſometimes not; but, to ſay the Truth, Medicines will generally have little or no Effect, when the Diſorder is confirmed or inveterate, notwithſtanding what ſome may boaſt of their wonderful *Arcana* for this Purpoſe[a]. Almoſt the ſole Relief is therefore to be had from the Surgeon's Hand and Inſtruments;

[a] Hovius audaciouſly aſſerts (*in Lib. de circulari Humor. in Oculis Motu*, Pag. 122.) that he can thus, at any time, cure all ſorts of Cataracts, whether recent or inveterate: But, upon the ſtricteſt Enquiry into the Truth of the Matter, I can meet with no Inſtances of his Succeſs.

ſince

ſince we very rarely meet with Inſtances of this Diſorder being cured by leaving it to Nature alone: And yet, by the Operation itſelf, a Cataract that bids faireſt for Recovery, though treated in the moſt judicious Method, ſhall frequently be the worſe for it, when one that ſeemed to be irrecoverable ſhall be cured by the ſame Treatment, beyond all Expectation. However, a Cataract is much milder and more tolerable to the Patient than many other Diſorders which we eſteem deſperate and incurable; becauſe neither the Diſeaſe nor the Operation are uſually accompanied with intenſe Pain, nor Hazard to the Patient's Life. But, in the general, thoſe Cataracts are moſt likely to be cured, which are mature and not complicated, the Patient being capable of diſtinguiſhing Light and Darkneſs, and the Pupil retaining its natural and free Motion: But there can be little Hopes of ſucceeding in thoſe where the Pupil is rigidly contracted, the *Uvea* firmly attached to the Cataract, or where the Pupil, having loſt its natural round Figure, is lacerated, angular, and variouſly diſtorted. The Succeſs of the Operation is rendered ſtill more doubtful, if the Patient is weak, aged, or afflicted with a violent Head-ach, or when the Eye is too much ſhrunk up, or enlarged and ſwelled. The Cataract is alſo the worſe, as it degenerates more from the Pearl Colour; for the moſt unuſual Colours always proceed from and denote the worſt Affections of the Eyes; yet even many of theſe are often cured by the Operation beyond Expectation, when the Eye is free from other Diſorders. For the milky and purulent Cataracts, though there is Danger of the opake Matter mixing with the aqueous Humour in the Operation, ſo as to render the Succeſs of it doubtful, yet it has been ſo often obſerved by the moſt expert Oculiſts, that this Matter will ſubſide to the Bottom of the Eye, and the Humours recover their former Clearneſs. It is indeed difficult to couch a variegated or marbled Cataract, as being too ſoft, and not yet arrived to a due Conſiſtence; and therefore when this Species does not give way to Remedies, you ought to defer the Operation till the whole Pupil appears opake, which denotes the Cataract to be ſufficiently mature. The Diſorder has been judged the more difficult to cure, as it is more inveterate, by the ancient Surgeons and Phyſicians; and yet it has been obſerved by ſome of the modern Oculiſts, that Cataracts, without other Diſorders in the Eyes, may be often cured, though of twelve, eighteen, or even thirty Years ſtanding[a]. If the Patient cannot diſtinguiſh Light and Darkneſs, the Operation will be but of little more Service than for removing the Deformity of the Eye, becauſe then the Cataract is accompanied with an *Amauroſis*, or *Gutta ſerena*. In Infants the Operation is generally leſs ſafe, and more impracticable, than in Adults, by reaſon of their Impatience and Strugglings. Nor ſhould the Operation be performed on thoſe who have a Cough, Catarrh, Defluxions and Vomiting, before thoſe Diſorders are firſt removed; leſt by the Patient's being diſturbed in the Operation by thoſe Symptoms, his Eye might be irrecoverably injured and ſpoiled for the future. In thoſe Cataracts which move or fluctuate from one Side to the other, there is generally little or no Hope of the Operation ſucceeding; but when the opake Body appears before the Pupil, it may then be ſometimes extracted through an Inciſion in the *Cornea*.

XI. When the Cataract appears even deſperate or incurable, I think it is better to attempt to reſtore the Patient's Sight by the Operation, though in vain, Treatment of doubtful Cataracts.

[a] See MAITRE-JAN Lib. *De Morb. Oculor.* Cap. *De Cataractâ.*

vain, rather than leave him to certain Blindneſs without uſing the beſt Means; and this the rather, becauſe the Operation may be performed, without inducing intenſe Pains, or endangering the Patient's Life, which are indeed Reaſons ſufficient to deter moſt People from *Lithotomy*, and the more ſevere chirurgical Operations. When the Patient is blinded by the Cataract, he cannot be blinded again by the Operation, if it does not ſucceed. The more Danger and the leſs Proſpect there is of curing the Diſorder, the more Honour and Fame will the Operator acquire, by recovering the Patient's Sight beyond all Expectation.

Of the *Glaucoma* and *Gutta ſerena*.

XII. Surgery can be of little or no Service towards the Curing of a *Gutta ſerena*, as hath been hitherto univerſally allowed, till, of late, the *Engliſh* Oculiſt TAYLOR has given out, that he can cure it by an Operation; the Truth or Falſity of which Time will ſufficiently demonſtrate. The Diſorder we now ſpeak of, is not ſeated in the anterior or middle Part of the Eye, but either in the *Retina*, the optic Nerve, or in the Brain itſelf, to which Parts no Operation can be extended. If there is any Room left to expect a Cure, it will be more reaſonable to attempt it by ſuch internal Medicines as will raiſe a Salivation, and purge, adding at the ſame time *Phlebotomy*, Scarification, and Setons or Iſſues, eſpecially thoſe on the coronal Suture, or in the Neck. What we have ſaid of the *Amauroſis*, or *Gutta ſerena*, holds true in a worſe degree of the *Glaucoma*, which being an Opacity of the vitrious Humour, is univerſally allowed, both by the ancient and modern Surgeons, to be incurable by any Operation whatever. It is remarkable, that this vitrious Humour is ſometimes ſo much indurated, as well as diſcoloured, that it reſembles a Cartilage, as appears from an Obſervation formerly communicated to me by the celebrated Anatomiſt and Archiater LANCISI.

The two Methods of curing Cataracts.

XIII. There are chiefly two Methods of curing Cataracts, either by couching with the Needle, or by the Uſe of internal and external Remedies. It is true, there are ſome who reject all Methods of treating Cataracts by Medicines as uſeleſs and trifling; yet I think there are ſome Caſes in this Diſorder which ought to be recommended to the Care of the Phyſician. Nor are there Inſtances wanting, as well among the Moderns as Ancients [a], of Patients who by the Help of Nature, aſſiſted with Medicines, have been freed from Cataracts beyond all Expectation, eſpecially when the Diſorder is incipient, and not firmly rooted or fixed in the cryſtalline Lens. But leaving the Phyſician to direct a proper Regimen and Courſe of Phyſic adapted to the Patient's Habit, Age, and other Circumſtances, we ſhall here proceed immediately to deſcribe the Methods of curing Cataracts chirurgically, by the Help of the Hands and convenient Inſtruments.

Surgeons adviſed to be diligent in learning this Operation.

XIV. But firſt it may be proper for us to admoniſh Surgeons to make themſelves better acquainted with the Operation for couching Cataracts, and to be more converſant in the Practice thereof, and not to leave the Buſineſs to Quacks and itinerant Pretenders, as we have ſeen it done but too much of late [b]. If the Practice is, as we ſee often, well enough executed by theſe boaſting Pretenders, what might we not expect from the Hands of the more prudent and

[a] Vide CELSUS *Lib.* VI. *Cap.* VI. and the modern Writers on the Diſorder.

[b] It is a little extraordinary, that M. GARENGEOT ſhould take no Notice of this Operation in his Treatiſe, as if it made no Part of Surgery.

regular

regular Surgeon, were he to engage more in this Practice, which is, in reality, attended with leſs Danger or Hazard than the common Operation of *Phlebotomy*; for in couching a Cataract, you run no Riſque of wounding a Nerve, Tendon, or Artery, as you do in opening a Vein. But leſt our Reader ſhould think we are recommending the Operation, for its Eaſineſs, to the Practice of every one, though ever ſo unſkilful, we ſhall here enumerate the ſeveral neceſſary Qualifications for an Oculiſt, whom we may venture to truſt in the Cure of this Diſorder. 1. He muſt be very well verſed in the anatomical Structure, and in the Functions of the ſeveral conſtituent Parts of the Eye, that he may avoid injuring any of them ignorantly. 2. He muſt be well acquainted with the beſt Inſtruments and Methods of operating, to be learned from a frequent and cloſe Attention to the Practice of ſome expert Maſter. 3. His Mind muſt be intrepid, his Hand ſteddy, and his Eye ſharp and quick-ſighted. 4. He ſhould be equally ready with his left as with his right Hand; that he may couch the left Eye with his right Hand, and the right Eye with his left Hand. 5. He muſt have made himſelf previouſly expert in the Practice, by repeated Trials upon the Eyes of Brutes, and of dead Men, before he ventures to couch the Eyes of the living.

The Time of Couching, and previous Preparation of the Patient.

XV. But, in order to the more ſucceſsful and eaſy Performance of this Operation, it will be previouſly neceſſary for the Surgeon to appoint the moſt convenient Time, and to prepare his Patient in the beſt manner, by a proper Regimen and Medicines. With regard to the firſt, ſuch a Seaſon ſhould be choſe, in which the Air is pretty temperate as to Heat and Cold, as in Spring and Autumn. The Day appointed for the Operation ſhould eſpecially be ſerene and clear, and the Hour generally in the Forenoon; not but the Afternoon will do well, and may be in ſome Caſes preferable for weak and timorous Patients, who are uſually in better Spirits after a moderate Dinner. The Apartment for couching the Patient in will be fitter as it is lighter, provided the Sun does not ſhine in upon you; for ſo ſtrong a Light as the Sun's Rays will cauſe the Pupil to contract itſelf, ſo that you cannot have ſo large a View of the Parts and Inſtrument within the Eye. As for the Preparation of the Patient, he ſhould not only obſerve a proper Regimen and Diet a few Days before the Operation, but he ſhould alſo in that time take ſome alterative and evacuating Medicines, with the Uſe of *Phlebotomy*, to prevent the Eye from being moleſted by intenſe Pain, Inflammation, Suppuration, and perhaps a Loſs of the whole, after the Operation has been performed [a]. It may alſo be generally convenient to give the Patient a Clyſter, if he has not eaſed himſelf lately: And, that his Courage may not fail him, the Operator ſhould take care that he may have ſome Gravy-Soop, or other ſtrengthening Suppings in the Morning, before he begins his Operation. Laſtly, nothing can more conduce to the Patient's Recovery, and the Prevention of Accidents, after the Operation, than to procure him a ſound Sleep afterwards by an Anodyne Draught or Emulſion, by which the Faculties both of his Body and Mind will be recruited, and the lately ſuppreſſed Cataract will not be apt to aſcend again.

[a] Such a Caſe as this is deſcribed by my Son, in his Account of the Operation for a Cataract, performed by TAYLOR at *Amſterdam* in 1735, upon one of our Friends.

Of the Aſſiſtants and Needles.

XVI. The Surgeon ought never to undertake the Operation by himſelf, but to provide two Aſſiſtants, one to hold the Patient's Head, (as in *Tab.* XVII. *Fig.* 1 A.) and the other, to adminiſter the Needle and other Neceſſaries. But he muſt be more particularly provided with *couching Needles*, and with a *Speculum Oculi*; of the *Speculum* you have two Forms at *Fig.* 15 and 16. and of the couching Needles there are a great many kinds, the chief of which are repreſented in *Tab.* XVII. *Fig.* 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11. though the beſt of them are, in my Judgment, thoſe at *Fig.* 5, 6 and 10. all which have a little broad and ſharp Point like a Tongue, or like a Barley-corn, but flatter, and that at *Fig.* 6. with a *Sulcus* in its Point, ſeems better adapted to couch the Cataract, than any of thoſe which have either a narrower or a broader Point; for thoſe with too ſlender a Point, as in *Fig.* 2 and 4. do eaſily lacerate the Cataract; and theſe with a more obtuſe Point, as *Fig.* 8. meet with Difficulty in perforating the Coats of the Eye. For theſe Reaſons many Surgeons uſe two Needles in this Operation, one with a ſharp Point, (*Fig.* 7 and 9.) to perforate the Coats of the Eye, and the other with a broader or more obtuſe Point (*Fig.* 8.) to depreſs or couch the opake cryſtalline Lens; but it is much eaſier to write of the Advantage of uſing two Needles, than to experience it in Practice. But whichever Sort you chuſe, Care muſt be taken, that it be firſt well poliſhed with Cloth or Leather, before you uſe it to the Eye, that neither its Roughneſs, nor any Particles of Ruſt, may injure that very tender Organ. Mr. Freytage before-mentioned, greatly recommends a Needle ſhaped like a Hook, for extracting membranous Cataracts out of the Eye; but if this ſucceeds ſo well, why did he not give us the Figure of it?

Apparatus of Dreſſings deſcribed.

XVII. That there may be no Obſtruction, nor any time loſt in the Operation, it will be neceſſary to provide every thing in order which may be wanted for the Dreſſings, after the couching is performed. Such as, 1. a cooling *Collyrium ex Aq. Plantag. cum Ovi alb. ſubact. & cum Aluminis, vel Tutiæ, vel Croci, aut Camphoræ portiunculâ.* Others uſe common *Sp. Vini* for a *Collyrium*. St. Yves uſes a Mixture of ten parts Water and one *Sp. Vini*, which he recommends as the beſt. 2. A large Compreſs of ſoft Linen, ſufficient to cover the diſeaſed Eye. 3. A Bandage of about three Ells long, and two Fingers broad; or elſe an Handkerchief folded together in Form of a Triangle, to retain the Compreſs and Dreſſings on the Eye. Laſtly, 4. you muſt provide ſome *Aq. Reg. Hungar. vel Acetum, vel Sp. Cl. &c.* to rub the Patient's Noſtrils, if he ſhould faint in, or ſoon after the Operation.

Poſition of the Patient.

XVIII. There now remains but one more Pre-requiſite before the Surgeon enters on his Work, and that is, to fix and ſecure the Patient in the moſt convenient and advantageous Poſture. He therefore muſt be placed againſt the Light on a much lower Seat than that of the Operator, as you may ſee in *Tab.* XVII. *Fig.* 1. E. the Surgeon himſelf C, being ſeated on a much higher Chair D. If the Patient can ſee either perfectly, or but in part with the Eye, which is not couched, it muſt be firſt covered or blindfolded with a Handkerchief or Bandage, leſt, by ſeeing the Inſtrument approach, he ſhould move his Eye, and diſturb the Operation. Upon which account it may be alſo proper to admoniſh the Patient, that if his Eye ſhould recover its Sight very ſuddenly in the Operation, as is not unfrequent, he may not ſtir, or make any Exclamations of Joy till it is over, leſt, by a ſmall irregular Motion, the whole Cure ſhould be fruſtrated,

fruſtrated, and his Sight loſt for ever. The Patient ſhould fix his Hands on the Surgeon's Thighs, and his Legs alſo betwixt thoſe of the Operator; and ſometimes it may be proper for an Aſſiſtant to hold up his Feet; that he may not riſe out of the Chair before the Operation is finiſhed. Behind the Patient muſt ſtand the Aſſiſtant A, ſecuring the Head with his left Hand on the Forehead, and his right Hand upon the Chin, which he muſt preſs cloſe to his Breaſt, ſo as to hold the Head firm and ſteddy; becauſe a very ſmall Motion of the Head may cauſe perpetual Blindneſs, as we are aſſured by ſad Experience.

Method of operating.

XIX. Every thing being thus prepared in Readineſs, the Patient is ordered to open his Eyelids as wide as poſſible, and to turn his Eye inwards towards his Noſe, that a ſufficient Portion of the White of the Eye may appear in the leſſer Angle of the Orbit towards the Temple. The Operator now divaricates the Eyelids with the fore Finger and Thumb of his left Hand, when it is the left Eye, and of his right Hand when it is the right Eye he couches; and thus he at the ſame time firmly ſecures the Eye from moving; ſee *Fig.* 1, and *Fig.* 14. Some there are who uſe the *Speculum Oculi*, *Fig.* 15 or 16, for this purpoſe, which, in my Opinion, will more impede than aſſiſt the Operator; but I ſhall not adviſe thoſe to reject it, who are fond of uſing it. The Oculiſt next takes the couching Needle, handed to him by an Aſſiſtant, betwixt the Thumb, fore and middle Finger of his right Hand, in the manner we uſually hold a Pen in writing, as you may ſee in *Fig.* 1. and *Fig.* 14. He then places the two lower Fingers of the ſame Hand upon the Patient's Cheek, to ſupport thoſe which guide the Needle, and that they move freely, as in writing; then he carefully enters the Needle almoſt in the middle of the White of the Eye [a] betwixt the *Cornea* and external Angle of the Orbit, proceeding, not obliquely, but ſtraight, through the Coats of the Eye over-againſt the Cataract, to avoid wounding the Blood-veſſels; ſee *Fig.* 14 A. As ſoon as the Needle is perceived to be through the Coats of the Eye, which may be known by your loſing the Reſiſtance, its Point is then inclined towards the Cataract; ſee *Fig.* 14 B. which being entered by the End of your Inſtrument, you thereby endeavour to depreſs it gently below the Pupil to the *Fundus* of the Eye, whether it be a Membrane or an Opacity in the cryſtalline Lens; for we are not as yet furniſhed with diſtinguiſhing Marks ſufficient to know one Caſe from the other by their external Appearance, except the Obſervations of St. Yves. If you perceive the Cataract deſcend with the Point of the Inſtrument below the *Pupilla*, which it will do the firſt time, when mature and conſiſtent enough, you are then to continue it there a little while, that it may afterwards ſtay at the *Fundus* of the Eye; and if, upon elevating your Inſtrument again, the Cataract does not riſe above the Pupil, your Operation is well performed; and therefore the Needle is now to be drawn out of the Eye in a ſtraight Line as it entered. If the Cataract riſes again afterwards above the Pupil, as it frequently does, you muſt again couch it with the ſame Needle, as before, keep it down a longer Time, till it remains ſuppreſſed below the Pupil. M. Freytage indeed adviſes to

[a] The true Place for perforating the Coats of the Eye by the couching Needle has been largely and elegantly treated of in *Mem. Acad. Reg. Pariſ.* An. 1726. pag. 370. Edit. *Amſtel.* by M. Petit, who aſſigns the Place to be two lines Diſtance from the *Cornea*. The Place approved of by Taylor, we ſhall conſider hereafter.

extract the Cataract, which he thinks is always a Pellicle, by a Hook through the *Cornea*, as, he ſays, he has frequently ſeen done by his Father. But as he neither deſcribes the Hook, nor the Method of Extraction, and as I much doubt whether this Hook would not alſo extract or lacerate the *Retina*, *Choroides* and *Sclerotica*, it is, in my opinion, beſt to neglect his Advice.

Reflections on the Operation.

XX. When the Cataract adheres firmly to any of the Coats of the Eye, it is often a very difficult Taſk to couch or depreſs it entire; and therefore in this Caſe you may firſt divide it with the Needle, and then couch or depreſs each Part ſeparately. And the ſame muſt be done if you happen to lacerate, or break the Cataract in pieces in the Operation; and, by this means, the Patient has often recovered his Sight, as we read in Celsus, Guillemeau, Parey, Barbet, Briſſac, and as I have twice obſerved myſelf. If the Cataract adheres ſo firmly to the *Uvea*, that it can hardly be thence ſeparated, it is often convenient to perforate it in the middle; by which means the Rays of Light paſſing through the Perforation to the *Retina*, the Patient can ſometimes ſee tolerably well afterwards: Which Practice may perhaps ſucceed beſt when the Cryſtalline is very thin; for I once found it ſo diminiſhed in Thickneſs in a dead Subject, that it was ſcarce thicker than one's Thumb-nail, and firmly adhered at the ſame time to the *Uvea*. But when the Cataract appears to be yet too ſoft, it is adviſeable to withdraw the Needle, and defer the Operation, till it becomes more conſiſtent, rather than deſtroy the Patient's Sight by confuſing the Humours. When both Eyes are to be couched, it is beſt not to perform the Operation on both at one time, but to intermit a few Days, that the Patient may the better endure the ſame without too violent Symptoms. If you couch the right Eye, the Operation muſt be reverſed, that is, you muſt hold open the Eyelids with the Thumb and Fingers of your right Hand, and couch the Cataract by the Needle with thoſe of your left, becauſe the Vicinity of the Noſe to the greater *Canthus* of the right Eye, will impede the Action of the right Hand for this Operation; though in *Tab.* XVII. *Fig.* 17. you have the Figure of a Needle contrived and ſent me by a Friend, with which you may couch the right Eye with the right Hand. A the Needle, B the Handle, C the Incurvation which reſts on the Noſe.

Treatment after the Operation.

XXI. It is a common Practice with Mountebanks and itinerant Oculiſts, to hold up their two Fingers extended, or elſe a Glaſs of Wine, before the Patient's Eye, as ſoon as the couching Needle is extracted, calling out to know what the Object is, or of what Colour it appears, and if the Patient can diſtinguiſh, and anſwer rightly, they then conclude the Operation to have been well performed. But this is, by the more prudent Surgeons and Oculiſts, judged to be a pernicious Method, becauſe by the Patient's ſtraining his Eye too ſoon to view the Objects, the Cataract is often rouſed and elevated again. It is therefore much better to defend the Eye immediately after Couching with a Compreſs dipt in ſome *Collyrium*, and ſecured by a Handkerchief, that the *Retina* may not be injured by a too ſtrong Action of the Light. It will be neceſſary to bind up both the Eyes, though you couched but one, becauſe if you leave the ſound Eye uncovered, it will perhaps be looking at Objects, and will conſequently draw or ſtrain the diſeaſed Eye in the ſame Direction, which may remove the Cataract, and cauſe it to aſcend again, or elſe induce an Inflammation, or other bad Accidents.

XXII. After

XXII. After your Dreſſing and Deligation, the Patient ſhould be laid on his Bed, upon his Back with his Head elevated, and retained almoſt erect by Pillows, and continue very quiet and compoſed for the ſpace of eight Days without coughing, ſneezing, laughing, intenſe talking, or eating Food of a hard Digeſtion, in order to prevent the Cataract from riſing or being diſturbed. No Surgeon can aſſert that the Cataract ſhall continue ſuppreſſed after the firſt Time of couching; but the Patient has this advantage, that if it aſcends it may be again ſuppreſſed, and his Sight recovered by the Operation; accordingly MAITRE-JAN writes, that a Patient whom he couched in Autumn had a Return of his Cataract in the Spring following; but it was happily removed again by repeating the Operation. We have even ſome Inſtances of the Cataracts having ſubſided again of themſelves, after they had riſen above the Pupil. How to prevent the Cataract from riſing.

XXIII. A few Hours after the Operation it will be convenient to bleed the Patient in proportion to his Strength and Fulneſs of Habit, to prevent an Inflammation in the wounded Eye, and to repeat the ſame, if neceſſary, with the Uſe of *Collyria* externally, and cooling Purges internally. It is very remarkable, that the Patient is often traubled with a Vomiting an hour or two after the Operation, as I have frequently obſerved, and imagine to ariſe from the Conſent of the Nerves, and their Irritation in the Operation, which ſoon goes off afterwards, and which I find has been alſo obſerved by Mr. FREYTAGE. However, this Symptom of Vomiting is no good Preſage, becauſe the Patient's ſtraining in this Action often Cauſes the Cataract to aſcend. In the Evening after the Operation you ſhould order the Patient an anodyne Emulſion, to compoſe him to Reſt, becauſe Watchings and Reſtleſſneſs very often occaſion the Cataract to aſcend again above the Pupil. The Diet and Regimen here muſt be ordered the ſame as we have directed in Wounds and inflammatory Diſorders. Laſtly, if the Patient does not go to Stool freely without ſtraining, it will be proper to help him with a Clyſter; nor ſhould he be permitted to diſturb his Head by riſing out of Bed for this Office, but, for the firſt few Days after the Operation, it will be more convenient to uſe a Bed-pan; all which Precautions are neceſſary, to prevent the lately depreſſed Cataract from being diſturbed or raiſed again above the Pupil. Further Treatment.

XXIV. With regard to the Deligation and ſubſequent Dreſſings, it will be convenient to remove the Bandage very gently on the firſt Evening after the Operation, and after renewing the Compreſs dipt in ſome *Collyrium*, applying the Bandage again as before; on the following Days this Proceſs muſt be repeated Morning and Evening at leaſt, and ſometimes four or five times in a Day, becauſe the Inflammation then becomes more intenſe, and the Compreſſes dry much ſooner; and therefore the Operator ſhould at this time be more ſollicitous to guard the Light from the Eye, eſpecially when the Inflammation runs high. If the Eye continues in a good Condition with but a ſlight Inflammation, you muſt continue this Method of dreſſing till the eighth Day, when all the Danger will be over, and you may by degrees remove the Bandage, and admit the Light to the Eye, which ſhould be for ſome time guarded at firſt with a piece of green Silk hanging over the Forehead. On the tenth Day, if nothing forbids, the Patient may riſe and walk about his Chamber, provided his Window-curtains are drawn, and his Eyes defended with green Silk as before, Deligation.

fore, which he may by degrees lay aſide, and return to his former Courſe of Life.

The Removal of Accidents.

XXV. That the young Surgeon may the better underſtand how to relieve the ſeveral Accidents which may attend this Operation, we ſhall conſider each of them ſeparately. And, 1. if a ſmall Portion of Blood ſhould be extravaſated, and eſcape into the aqueous Humour, ſo as to render it in ſome meaſure obſcure and turbid, you muſt diſpatch the Operation as faſt as poſſible, and dreſs up the Eye with a Compreſs dipt in the fore-mentioned *Collyrium*, by which means ſlight Extravaſations have been frequently obſerved to be diſperſed. But if a large Quantity of Blood mixes with the aqueous Humour, it will then be almoſt impoſſible to avoid a Suppuration, termed *Hypopion*, or other ill Conſequences, which endanger perpetual Blindneſs, or a total Deſtruction of the Eye. Yet even here you will find great Benefit from plentiful Bleeding, with the Application of diſcutient Bags ſtuffed with Fennel, Sage, Hyſſop, and Roſemary, and, being boiled in Wine, frequently to apply them warm to the Eye. 2. If the aqueous Humour itſelf eſcapes, or runs out of the Eye, in the Operation, ſo as to leave the *Cornea* flaccid, the Eye itſelf is not in any great Danger thereby; for the Humour will be reproduced ſo as to fill the *Cornea* again in a few Days. Laſtly, 3. if great Inflammation ſhould ariſe, you muſt omit nothing that will conduce to ſuppreſs it, as plentiful bleeding, and drinking of Water, or other cooling and diluent Liquors, to bathe the Temples frequently with *Sp. Vini Camph.* to apply Bliſters behind the Ears, and clyſter the Patient as you ſhall ſee neceſſary.

Fabric of the couching Needle.

XXVI. From what has been ſaid, I think it is ſufficiently apparent how much the Moderns are improved above the Ancients, as to their Knowledge of the true Nature or *Diagnoſis*, *Prognoſis*, and method of curing this Diſorder; for upon obſerving that a Cataract was rather conſtantly formed by an Opacity of the Cryſtalline, than from any Membrane, Brisseus conſequently judged, that thoſe couching Needles would ſucceed beſt, which were made with a ſulcated and pretty broad Point, as in *Tab.* XVII. *Fig.* 6. *lit.* C. For by uſing thoſe ſlender-pointed Needles of the ancient Surgeons, whether made of Gold, Silver, or Steel, it was almoſt impoſſible to avoid cutting or lacerating the Cataract in couching it. But the couching Needle of Brisseus is made with an acuminated, as well as a broad and ſulcated Point, that it might the more readily perforate the Coats of the Eye. The Handle of the couching Needle A B is octangular, and the Side marked E E lying even with the *Sulcus* in its Point, is hatched, or otherwiſe particularly marked, that you may judge, by the poſition of the Handle, how the Point of the Needle is directed, in reſpect of the Cataract in the Eye. Laſtly, the Riſing or Protuberance of the Inſtrument, marked D, ſerves to indicate how deep it has entered into the Eye.

Other particular Needles.

XXVII. Thoſe Surgeons who have perſuaded themſelves, that a Cataract proceeds from a Membrane or Tunic, have alſo provided themſelves with an unciform Inſtrument, and extract the ſaid Membrane through the Puncture made in the Coats of the Eye by the Needle, to prevent the Diſorder from returning, as it might, if they were to leave the Cataract at the bottom of the Eye. Some of their Inſtruments were made tubular, in order to ſuck out the Membrane from the Eye, others were made like a pair of ſmall Pliers in the Shape of a Needle, as in *Tab.* XVII. *Fig.* 10. and others again were like ſmall Hooks which

which they introduced and extracted through a *Canula*, together with the Tunic or Cataract, according to FREYTAGE. But their Methods and Inſtruments were as uſeleſs and miſchievous as the Notion of the Diſorder was falſe.

When the Cataract comes thro' the Pupil.

XXVIII. We have further to adviſe, that if the Cataract ſhould further extend itſelf, or ſlip through the Pupil, as it ſometimes may, it will then be proper to make a ſmall Inciſion in the lower Part of the *Cornea*, and thereby extract the Cataract by a ſmall Hook or Probe; an Inſtance of which Practice we have given in our profeſſed Treatiſe on this Diſorder.

TAYLOR's Method.

XXIX. The noted Oculiſt, TAYLOR, propoſes a new Method of his own, as he ſays, for couching Cataracts, in the ninth Chapter of his Treatiſe, which he deſcribes as follows: The Patient being ſeated as uſual, and his Eye held firm by the *Speculum Oculi*, he then makes a ſmall longitudinal Inciſion with a Lancet * of about half a Line in Length below the uſual Place; which Inciſion he continues through the external and internal Coats of the Eye into the vitrious Humour. He then takes a *plano-convex* Needle of a very ſlender or thin make, and paſſes it through the Inciſion directly into the Eye, with its convex Part upwards and towards the bottom of the cryſtallin Lens; he next gently elevates the Point of his Needle a little, till he finds a ſmall Reſiſtance on it from the cryſtalline Lens above it, which he alſo perceives to move, by looking through the Pupil. Being thus aſſured the Point of his Needle is under the Capſule of the Cryſtalline, he then guides his Needle downward towards the bottom of the Eye, to divide the vitrious Humour, and make a Space for receiving the Cryſtalline, which he next depreſſes. In order to couch the Cryſtalline, after having divided the vitrious Humour, he draws his Needle about two Lines further out of the Eye, and then inſerts the Point of it into the lower part of the Capſule of the Cryſtalline, which he thus incides or opens, as he ſays, without injuring the *Ligamentum ciliare*, and, in thus opening the Capſule, he alſo endeavours to enlarge the Space for receiving the Cryſtalline. Laſtly, in order to couch or depreſs the opake Cryſtalline, he again extracts his Needle almoſt three Lines more out of the Eye, then elevating its Point, and fixing the ſame into the upper Part of the Cryſtalline, he endeavours to depreſs and lodge it in the Space before made for its Reception in the vitrious Humour at the *Fundus* of the Eye, and then gently extracts his Needle. By this means he aſſerts, that the *Uvea* and *Ligamentum ciliare* are not in the leaſt injured, but remain in their natural and ſound State; whereas in the common Method of couching they are uſually lacerated, to the great Detriment of the Eye, and its Office of Viſion. To conclude, the Subſtance of his Method of operating, which we have here briefly related, is ſo ſwelled and obſcured, by ſtuffing it with frivolous Cautions and Circumſtances in his Treatiſe, from whence we have extracted it, that it there takes up more than three times the Compaſs in which we have here repreſented it; and yet have we omitted nothing but what was either inſignificant or unintelligible. There are even ſo many Circumſtances related, that it ſeems impoſſible the Author himſelf ſhould attend to all of them; and this may poſſibly be one Reaſon of his ill Succeſs in Practice, his Operation being

* He does not give us any Reaſon for uſing a Lancet, or for making his Inciſion longitudinal rather than oblique or tranſverſe, nor can I ſee any Reaſon for it; but it is a ſtanding Maxim in Surgery, never to uſe ſeveral Inſtruments for what may be done as well by one.

followed

followed with excruciating Pains, moſt violent Inflammation, and a Suppuration of the Eye, inſtead of recovering the Patient's Sight; as you may ſee related more at large in my Son's Treatiſe, on the unhappily couching a Cataract in our Friend at *Amſterdam* by TAYLOR in 1735. However the Practice deſerves to be conſidered and tried by the more prudent Oculiſts, and the Succeſs of it will in Time determine the Author's Merit.

His Treatment of the ſhaking Cataract.

XXX. When the Cataract moves, or when the opake cryſtalline Lens is ſlipt out of its Capſule, and fluctuates behind the Pupil, which TAYLOR then calls a *ſhaking Cataract*; the Diſorder, he ſays, will now require a different Method of Cure, to explain which he makes the Buſineſs of two diſtinct Chapters, which import no more than that he here paſſes his Needle, as before, into the Eye, directing its Point to the upper and anterior Part of the Cataract, or opake Cryſtalline, to avoid injuring the ciliary Ligament, and then, with the plain Surface of his couching Needle, he depreſſes the ſame to the bottom of the vitrious Humour.

His Treatment of the falſe Cataract and *Glaucoma*.

XXXI. In ſome Cataracts, which he terms *falſe*, he ſays, the Capſule of the Cryſtalline is vitiated, and become opake, as well as the Lens; the Method of couching both of which, and freeing them from the ciliary Ligament, is related by him in ſo prolix a manner, that he again makes it the Buſineſs of two whole Chapters. Two other Chapters are again employed in explaining his Operation for the *Glaucoma*; by which Name he underſtands, contrary to all his Predeceſſors, an Opacity joined with an Expanſion of the cryſtalline Lens, which, with its vitiated Capſule, are extended or protruded forwards cloſe to the Margin of the Pupil; for the Cure of which he proceeds in the ſame manner as before. But I know not what Right or Authority he has, more than his own Aſſurance, to impoſe this Name to a Diſorder, different from what it has been all along intended to ſignify by our Predeceſſors; for it will appear quite unwarrantable even to make, and much more to transfer Names, without an abſolute Neceſſity; ſince what he calls a *Glaucoma*, is, I think, a Species of the Cataract, and not a Diſorder of the vitrious Humour, ſeated much deeper in the Eye, as the Ancients have all along underſtood by the Name.

His Extraction of Cataracts thro' the *Cornea*.

XXXII. We before obſerved at N° XXVIII. that thoſe Cataracts which have eſcaped through the Pupil, may be extracted by an Inciſion made in the *Cornea*; but I have been aſſured from *England*, that this famous Oculiſt there boaſted, that he could, and does extract Cataracts in this manner, which are even fixed behind the Pupil and *Uvea*; but I could never yet learn the Truth of his Aſſertion, or that he ever performed the Fact.

CHAP. LVI.

Of Dilating Contractions of the Pupil.

Deſcription of the Diſorder.

I. WE are now to treat of an Operation related to the foregoing, in which the Coats of the Eye are perforated by an Inſtrument, almoſt in the ſame manner as in couching a Cataract, in order to open an imperforated or contracted Pupil. The Diſeaſe we are now ſpeaking of is therefore ſuch a total

Fig. 8.
Fig. 9.
Fig. 10.
Fig. 11.
Fig. 12.
A
B
C
A
B
A
Fig. 1
C
Fig. 13.
D
E
B
Fig.
A
Fig. 19.
A
A
B

Plate 17

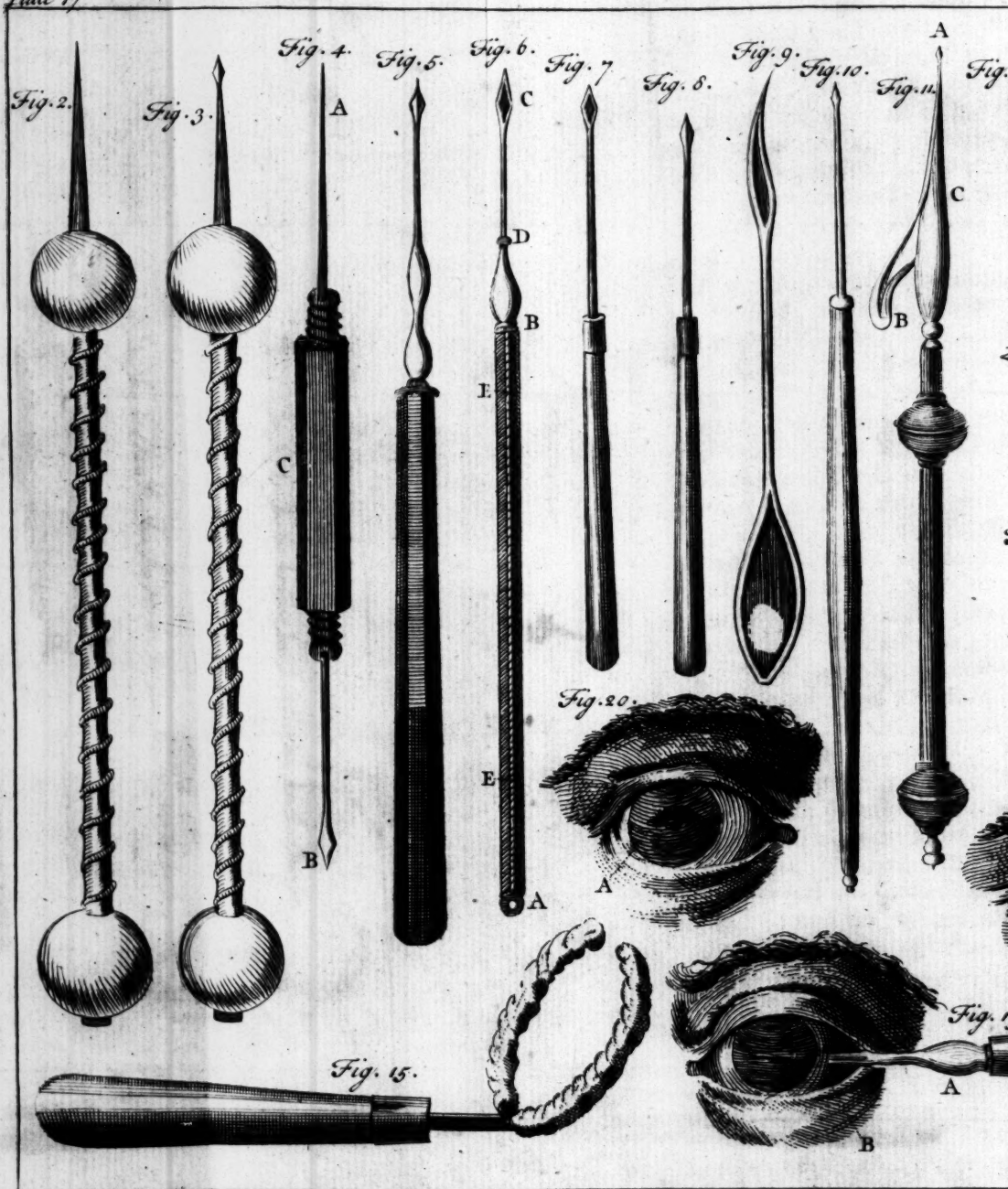
Fig. 2.
Fig. 3.
Fig. 4.
A
C
B
Fig. 5.
Fig. 6.
C
D
B
E
E
A
Fig. 7
Fig. 8.
Fig. 9.
Fig. 10.
Fig. 11.
A
C
B
Fig. 20.
A
Fig. 15.
A
B

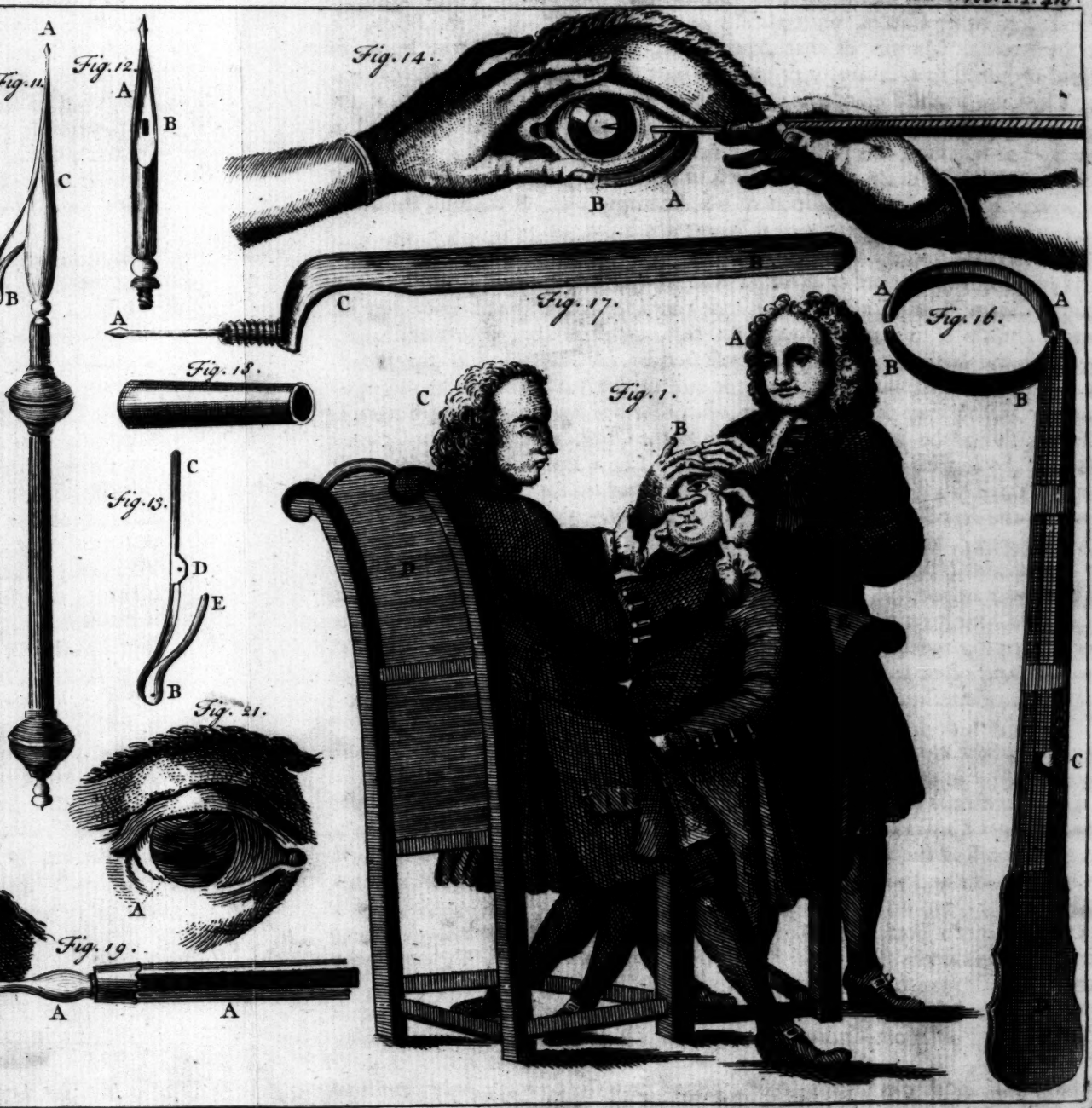
Fig. 11.
A
C
B
Fig. 12.
A
B
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Fig. 14.
B
A
C
Fig. 17.
A
A
Fig. 16.
A
B
B
Fig. 18.
C
Fig. 1.
B
C
Fig. 13.
D
E
B
Fig. 21.
A
Fig. 19.
A
A
C

Fig. 14.

Fig. 17.

Fig. 16.

Fig. 1.

tal or close Contraction of the Pupil, that it will not transmit Light enough to the bottom of the Eye, to enable the Patient to see Objects distinctly. Sometimes this Disorder has grown up from Infancy, and sometimes it arises from an intense Inflammation of the Eye, or some sudden and violent Constriction of the Pupil from other Causes, with a Palsy of the strait Fibres in the *Uvea*, or when the internal Margin of that Membrane, which constitutes the Pupil, is concreted or joined to a Cataract, or to some part of a Cataract, after the Operation. The Cure of the Disorder is generally esteemed extremely difficult, if not altogether impracticable; but the celebrated Mr. CHESELDEN has contrived a new method of relieving this Disorder, which he has not only tried several times with Success, but also described his Process in the *Philosophical Transactions*; and in the *Appendix* to the fourth Edition of his Anatomy, which we shall therefore give a Place here in our Surgery, as follows:

The Operation.

II. The Eyelids being held open by a *Speculum oculi*, he then takes a narrow and single-edged *Scalpel* or Needle, *Tab.* XVII. A A. almost like that for couching a Cataract, and passing it through the *Sclerotica* B, as in couching, he afterwards thrusts it forwards through the *Uvea* or *Iris*, and, in extracting it, cuts through the *Iris* in the manner represented by *Fig.* 20. A. If the Disorder is not accompanied with a Cataract, it will be best to perforate the *Iris* in the middle, as you may perceive by *Fig.* 20. otherwise when there is a Cataract, the Incision should be made a little higher in the *Uvea*, that the Cataract may not obstruct the Ingress of the Rays of Light. The Cataracts which sometimes accompany this Disorder, he says, are generally very small, and sometimes their Adhesion to the *Iris* is so firm, as to render it impracticable to couch or suppress them. In *Fig.* 21. the Incision or Aperture is represented lower than the center of the *Cornea* and *Uvea*, because in this Eye on which he performed the Operation there was an *Albugo*, or white Speck, upon the upper part of the *Cornea*, which obliged him to incise lower than usual. He does not indeed relate the manner of treating the Patient afterwards, to suppress and guard against an Inflammation, and other Accidents; but tis reasonable to suppose you must proceed in the same method as after the Operation for a Cataract.

An EXPLANATION *of the* SEVENTEENTH PLATE.

Fig. 1. Demonstrates the Position of the Patient, Surgeon, and Assistant, proper for couching a Cataract, as explained in *Chap.* LV. N° XVIII.

Fig. 2, 3. Represent the Silver couching Needles used by the Ancients, the first having a slender and round Point like common Needles, and the last a triangular point.

Fig. 4. Represents a double-pointed couching Needle, that marked A, being round and slender, and that at B a little broader or flatter; C denotes the Handle, which may be made of Silver, Brass, Ivory, or Wood.

Fig. 5. Is another Needle with a still broader Point, but sharp-edged, with which a Cataract may be more commodiously held and couched than by a smaller point.

Fig. 6. Denotes another couching Needle almost like the former, only furnished with a *Sulcus* in its *Apex*, which is recommended by BRISSEAU, and described more largely at N° XXVI of *Chap.* LV.

Fig. 7, 8. Repreſent two Needles from SOLINGEN and NUCKE, which are ſaid to be invented by the *Dutch* Oculiſt SALMASIUS, and to be both uſed in one and the ſame Operation. That at *Fig.* 7. is ſulcated and ſharp-pointed, almoſt like the preceding, and ſerves to perforate the Coats of the Eye, from whence BRISSEUS ſeems to have taken his at *Fig.* 6. But that at *Fig.* 8. is obtuſe, and made ſo as to paſs through the *Sulcus* of the preceding Needle, while it continues in the Eye to depreſs the Cataract.

Fig. 9, *and* 10. Repreſent two Needles of pretty much the ſame Uſe with the two preceding, and are taken from BERN. ALBINUS's *Diſputatio de Cataractâ, Francof. impreſſ.*

Fig. 11. Denotes the Needle propoſed by ALBINUS in his ſaid Treatiſe, for extracting a membranous Cataract out of the Eye; being ſo contrived that the Point A opens like a Pair of Pliers in the Eye, by depreſſing the little Handle B; though I much doubt whether it was ever uſed with Succeſs.

Fig. 12, *and* 13. Repreſent the Parts of the preceding Needle ſeparate and aſunder. *Fig.* 12. is the ſulcated Point, in which is lodged the other Point *Fig.* 13. theſe perforate the Eye the better, as they are more exactly fitted and poliſhed. They are connected by the Hinge B, C, D. *Fig.* 11, 12, *and* 13. E. *Fig.* 12. denotes a Spring to preſs the two points cloſe together, till you open them by depreſſing it with your Thumb on the little Handle B *Fig.* 11. to apprehend and extract the Membrane.

Fig. 14. Repreſents the method of holding open the Eyelids with one Hand, and of paſſing the Needle with your other, for couching a Cataract, the point B uſually appearing through the Pupil.

Fig. 15, *and* 16. Repreſent two *Specula Oculorum*, to hold the Eyes firm, and open their Lids in couching, and other Operations for the Eyes; the laſt is more correct than the firſt, as you may extend or contract the Circle A A, B B, by elevating or depreſſing the Button C. The Handle is denoted by D.

Fig. 17. Repreſents a Needle for couching a Cataract in the right Eye with the right Hand. A the point of the Needle, B its Handle, in which is a particular kind of Incurvation C to reſt upon the Noſe.

Fig. 18. Is a Cap or Sheath for including the Point of the ſaid Needle.

Fig. 19. Is taken from the *Appendix* to the fourth Edition of Mr. CHESELDEN's *Anatomy*, to ſhew the manner of directing his Cutting-needle to open or inciſe the cloſed or contracted *Uvea*.

Fig. 20. Denotes the manner of dividing the *Uvea* in its middle by the ſame Inſtrument, to tranſmit the Rays of Light into the Eye.

Fig. 21. Repreſents the manner in which Mr. CHESELDEN inciſed the *Uvea* lower than uſual, on the account of an *Albugo*, which infeſted the middle of the *Cornea* in this Eye.

CHAP.

CHAP. LVII.

Of the Pterygium, *or* Unguis Oculorum.

I. WHEN a preternatural Membrane is formed externally upon the Coats of the Eye, ſo as to extend itſelf over the *Cornea* and Pupil, and obſtruct the Sight, the Diſorder is then uſually denominated *Onyx* by the *Greeks*, and *Unguis* or *Ungula* by the *Latins*; 'tis alſo ſometimes named *Pterygium*, from its Reſemblance to the Wing of a Bat[a]. Sometimes the Pellicle or Film appears red, from the Number of the ſmall Blood-veſſels, and then it is uſually denominated *Pannus*. It moſt frequently ariſes in the Angles of the Eyes from the Temples or Noſe, and ſometimes from above or below, extending itſelf by degrees over the *Cornea*, (as in *Tab.* XVIII. *Fig.* 1, *and* 2. *aa.*) Sometimes it only adheres ſlightly to the *Cornea* by a few ſlender Fibres, and ſometimes again it is extended over the whole Eye, and continues moſt firmly and intimately attached to it, which uſually renders the Caſe much more difficult to cure. Deſcription.

II. While the Pellicle is but recent, and ſlightly attached, it may be removed by gentle Eſcharotics, ſuch as Powder *ex Sacchar. Canarienſ.* ʒj. *vitrioli albi vel aluminis uſti, vel etiam viridis æris Gr.* iv. *vel* vj. which muſt be carefully ſprinkled at Intervals by a little at a time upon the Membrane. Some uſe a Powder of the *Lapis ſciſſilis*, or of the *Os Sepiæ* mixed with Sugar. But as it will be difficult to uſe ſuch a Powder for Infants, it will be better to treat them with an Eye-water, as that of QUERCITAN, *cum vitriol. alb. & felle muſtelæ piſcis, &c.* which may be alſo uſed to Advantage for Adults. If the Diſorder is accompanied with an Inflammation, it will be convenient for you to treat the Patient accordingly by Bleeding, Bliſters, and cooling Medicines. M. ST. YVES ſets a great Value on the *Lapis medicamentoſus Crollii* diſſolved in Water, and uſed to waſh the Eye; though, in my Opinion, a Solution of *Vitriol. alb.* ℈ ß. *in Aquâ Chelidonii major.* ʒij. is little inferior, if at all. Cure by Medicines.

III. If the mild Eſcharotics before propoſed, are inſufficient for deſtroying the Pellicle, you muſt then extirpate it; in order to which the Patient muſt kneel down on his left Knee, if the right Eye be affected, and then lean his Head back againſt the Light upon the Surgeon's Lap, or Knees, who then takes the ſmall Hook, *Tab.* XVIII. *Fig.* 3. or *Tab.* XV. *Fig.* 30. and after the Eyelids held open by an Aſſiſtant, endeavours to paſs its point under the thickeſt or looſeſt part of the Pellicle, and by this means he ſtrives to elevate it a little. In the next Place he takes the Needle *a* armed with a Thread, *Fig.* 1. *b b.* and paſſing it under the Pellicle, ties it with a double Knot, and then, faſtening the two Ends in a Loop, *Fig.* 2. *b c.* he thereby attempts to make a gentle Elevation. This done, he now endeavours to ſeparate the upper and lower Margin of the Membrane with a Lancet, that he may afterwards cut off the reſt immediately in a ſtraight Line near the lacrymal Caruncle by a Pair of ſmall and ſtraight Sciſſors; he then draws back the Thread and Membrane towards the *Cornea*, and if it adheres any where to the Eye, frees it by degrees with a *Scalpel* or Sciſſors; in doing which the Operator muſt have a principal Cure by the *Scalpel.*

[a] CELSUS *Lib.* VII. *Cap.* 7. N° 4. and CASTEL. *Lex. Med. per* BRUNO. *ſub tit.* Onyx.

Regard to two things: 1. To avoid injuring the *Cornea*; and, 2. to obſerve that no part of the Membrane be left adhering to the Eye, which laſt might occaſion a Return of the Diſorder. Yet it is rather better to leave ſome part of the *Unguis* adhering to the *Cornea*, when its Separation is extreamly difficult, than to wound the *Cornea*, and leave irremediable Scars in it; and this the rather, becauſe any ſmall Portion of the Membrane left behind may be taken off afterwards, by treating the Eye two or three times in a Day with the gentle Eſcharotics before propoſed at N° II. Though there are ſome, who rather approve of the following *Collyrium* for removing the membranous Reliques:

℞ *Aq. Roſar. Damaſcenar. Plantag.* āā ℥j.
*Matr. Perlar. pp*t ℈j.
Sacchari Saturni Gr. vj.
Vitrioli albi Gr. iij *m. f. Collyr.*

M. St. Yves approves of waſhing the Eye for three or four Days afterwards with *Sp. Vini* diluted with Water, and then to uſe a Solution of the *Lapis medicamentoſus* in Spring-water. Laſtly, in extirpating the Pellicle, great Care muſt be taken not to cut off any part of the lacrymal Caruncle, and much more not to remove the whole of it; for if this Body be wanting in the greater *Canthus* of the Eye, where it ſtops and directs the Tears into the *Puncta lacrymalia*, the Patient will conſequently be troubled with a watery Eye, in which the lacrymal Humour will run down over his Cheek.

Other methods of Cure.

IV. Some of theſe Pellicles which appear red, from the ſmall Blood-veſſels extended to them from the Corners of the Eyes, will wither or eaſily fall off with the Uſe of Medicines, upon ſcarifying and dividing thoſe Veſſels in the *Canthus* of the Eye which feed and nouriſh them. Sometimes the *Cornea* is incruſted over with a glutinous matter, like Fat or a Membrane, which may be readily ſcowered off with the Gall of an Eel, Lamprey, or the Bile of ſome other Animal. This was probably the Caſe of *Tobias*, mentioned in the Old Teſtament. Sometimes indeed we meet with Membranes of this Nature, which are inſeparable from the *Cornea* by any means whatever; but this we cannot be aſſured of before Trial; and we ought rather to try the Operation in vain, than to relinquiſh the Diſorder, unjuſtly, as incurable. Laſtly, ſome Pellicles upon the Eye are extreamly painful and ſtubborn, inclining to a cancerous Diſpoſition; and theſe it may be beſt for the Surgeon to relinquiſh as incurable.

Pterygium of the whole Eye.

V. When the *Pterygium* or *Unguis* is extended over the whole Eye, it will be convenient to divide it by a cruciform Inciſion into four Parts, according to M. St. Yves, and then to ſeparate each of them from the *Cornea* and Eye, as we before directed for the *Unguis* in general, conducting the remainder of your dreſſing as we there preſcribed.

VI. Laſtly, when this Operation is to be performed upon the left Eye, the Patient ſhould riſe up from the Ground as ſoon as the Needle has been paſſed through the Membrane, and the Threads tied; and placing himſelf in a Chair, the Operator may have a better Command of the Eye than before, except he ſhould happen to be as active with his left Hand as with his right. If the Membrane appears to be thin and weak, Care ſhould be taken not to extend it too forcibly by the Thread leſt it ſhould break.

CHAP.

CHAP. LVIII.

Of the Albugo, Leucoma, Nebula, Nubecula, *and other Spots in the* Cornea *of the Eye.*

I. AS in ſeveral other Claſſes of Diſorders belonging to the Eye, ſo in this we meet with a great deal of Confuſion, by a Miſapplication and Reduplication of ſeveral Names, which are often uſed to import the ſame Diſeaſe, whence ariſe Difficulties and Miſtakes to the Learner, and Errors in the method of Cure. However, we find that the moſt eminent Surgeons and Phyſicians intend or mean by theſe Names a ſort of whitiſh Spots in the *Cornea*, though they appear not always alike, and of the ſame kind, being ſometimes larger or ſmaller, thicker or thinner, or more or leſs pellucid and protuberant. According to their different State and Condition they more or leſs obſcure the Sight, and ſometimes wholly intercept it. Hence we have alſo a Reaſon why the Blemiſh was ſometime called *Leucoma* by the *Greeks*, and *Albugo* by the *Latins*, or *Nebula* and *Nubecula*, according as it appeared more or leſs thick or pellucid. Deſcription.

II. The Cauſes of theſe Blemiſhes are various; for they may ariſe, 1. from an Obſtruction of the pellucid Veſſels in the *Tunica cornea*, and an Inſpiſſation of their contained Juices, proceeding from a violent Inflammation of the Eye; or, 2. from a Suppuration, and then an Induration of theſe Juices in the *Cornea* after an Inflammation, ſo that it by degrees becomes more opake, as it hardens, and puts on a whitiſh Hue, being ſometimes miſtaken for an *Unguis*. 3. Theſe Spots may ariſe from an external Eroſion or Ulcer in the *Cornea*; or, 4. from Puſtules or *Veſiculæ* in various inflammatory Diſorders, particularly, 5. from thoſe which are occaſioned by the Small-pox. 6. They may very often proceed from the Scars left after a Puncture in the *Cornea*, from a Sword, Knife, Fork, a Splinter, Glaſs, a Thorn, or the like; or laſtly, 7. from a Burn; or, 8. the corroding Acrimony of cauſtic Subſtances falling into the Eye; though they may ſometimes be formed of, 9. a peculiar Tunic growing to the Eye itſelf. Cauſes.

III. Theſe Diſorders of the *Cornea* are ſome more and ſome leſs difficult to remove, according to their Duration, and the particular Cauſes from whence they proceed, with the Patient's Age, and other Circumſtances. Infants may be more eaſily freed from them than Adults, when they are not of any long ſtanding. But for thoſe which are Scars formed from Wounds, Burns, Punctures, or the like, there is little or no Hope of removing them. *Prognoſis.*

IV. If any one is deſirous to be ſucceſsful in removing theſe Spots, he muſt adapt his method of Cure to the Cauſe of the Diſorder. For thoſe which ariſe from inſpiſſated Humours betwixt the *Laminæ* of the *Cornea*, and are not of long ſtanding, may be beſt removed by a proper Regimen, attenuating Diet, and Medicines, eſpecially a plentiful Uſe of thoſe Decoctions and Infuſions which are ſudorific. But then at the ſame time muſt be uſed externally *Phlebotomy*, Scarification, Bliſters, and frequent waſhing of the Feet. Upon the Eye itſelf may be alſo applied diſcutient Bags *ex fol. Hyſſop. Roriſmarin. flor. Chamom. Sem. fænic. &c.* boiled in Wine or Water, and frequently impoſed on Methods of Cure.

the

the Eye, or a Collyrium *ex Aq. fænic. cum. Sp. Vin. Camph.* Laſtly, it may be convenient for the Patient to hold his Eye ſometimes over the warm Vapours of Coffee, or a Decoction of the Woods. On the contrary, it will be here pernicious to uſe cold and aſtringent *Collyria*, eſpecially thoſe of white Vitriol, though they are much eſteemed; whereas warm Applications are found by Experience to be of the greateſt Service. When the Inflammation is diſperſed, the Patient may wet his Eye every Day with ſome of the *Aqua Ophthalmica* QUERCITANI, *cum Tutiâ pp.* made warm before uſing it. If any of the ſmall Veins proceeding to the Spot appear turgid on the white of the Eye, it will be proper to divide them by the double-edged and crooked Needle (*Tab.* I. *Fig.* 5. or *Tab.* XVI. *Fig.* 2.) a Lancet or Sciſſors. Laſtly, in ſome of them which are of long ſtanding, you may rather expect any thing than their Cure.

Cure of Spots and Abſceſſes.

V. In thoſe whitiſh Spots which proceed from Abſceſſes, or a Suppuration of Matter after an Inflammation betwixt the *Laminæ* of the *Cornea*, which they elevate like a Pea, or Pearl, whence they are ſometimes called *Pearls*; in theſe you ought to make an Inciſion into the *Cornea*, to diſcharge the included Matter, which might otherwiſe by degrees erode the *Cornea* and deſtroy the Sight. Your Inciſion for this purpoſe may be made either by the Lancet, or by a Couching-needle, *Tab.* XVII. treating the Eye afterwards with ſome of the diſcutient Medicines propoſed at N° IV. others uſe Viper's Fat, to cleanſe and heal the Puncture or Inciſion; but when the Matter is lodged deep, and not near the Out-ſide of the *Cornea*, it will be impoſſible to preſerve the Eyeſight diſtinct and perfect, either by this, or any other means.

Cure of an *Albugo* from an external Eroſion of the *Cornea*.

VI. But when the *Cornea* is eroded externally either from an Abſceſs, Inflammation, or any other Cauſe, the following method is taken by M. ST. YVES. Firſt, he removes the Inflammation, and then orders the Patient to waſh his Eye frequently with the *Aqua viridis ophthalmica* HARTMANNI, which is made weaker or ſtronger, according as the Patient can bear it; the admiral Virtues of which Water for removing Spots in the *Cornea*, are ſtrongly recommended by the ſame Author.

Cure of thoſe from Burns, or the Small-pox.

VII. In ſome of thoſe ardent or inflammatory Puſtules of the *Cornea*, which appear afterwards whitiſh and protuberant, like a Pearl or Grain of Millet, the beſt and moſt expeditious method of removing them is by perforating with a Needle, ſo as to diſcharge their contained Matter. And in thoſe Puſtules ariſing from the Small-pox, you ought to make an Apertion by a Needle or Lancet, immediately to diſcharge the eroding Matter, removing the Pellicle afterwards with ſome *Alumen uſtum cum Sacchar. cand. & Ovor. teſt. pp.* applied every Day to the *Cornea*; others uſe Tinder, or burnt Lint dipt in Oil; by either of which the remaining Film will by degrees vaniſh, according to ST. YVES, (*pag.* 229.) The ſame method of Cure muſt be taken for diſcharging the Matter in Puſtules formed in the *Cornea* from Burns, treating the Blemiſh afterwards with the Medicines we have directed in *Chap.* LVII. preceding.

Incurable Spots.

VIII. Theſe Spots of the *Cornea*, which ariſe from Wounds, Scars, or the Abuſe of the vitriolic *Collyria*, are ſeldom curable; as are thoſe alſo which render the *Cornea* quite opake, and are of very long ſtanding, or in which the natural Form of the Eye or *Cornea* are deſtroyed; in which Caſes it is therefore much better to leave the Patient to himſelf unmoleſted, than to torture his Eyes to no purpoſe, by a tedious Cou rſeof Remedies and Operations.

CHAP.

CHAP. LIX.

Of the Staphyloma.

I. UNDER the term *Staphyloma*, (the *Grape*) are chiefly compriſed two Diſorders of the Eyes, one in which the *Cornea* is more than uſually protuberant, as in *Tab.* XVIII. *Fig.* 4, 5, 6, *and* 7; the other in which the Pupil or *Uvea* breaks forth and forms an unſightly Tumor on the *Cornea*, either from internal Cauſes, or from ſome wounding Inſtrument forced through the Coat, in which laſt Caſe the Sight of the Eye is uſually deſtroyed; ſee *Fig.* 8. *a a.* A *Staphyloma* deſcribed.

II. There are various Species and Denominations of the *Staphyloma*, according to their Size and Shape, as the *Margarita*, *Myocephalus*, *Clavus*, *Mylon*, *ſive Pomum*, and the *Staphyloma*, or *Acinus* ſtrictly ſo called, of all which the biggeſt is the *Mylon*. But I have ſometimes obſerved not only the *Cornea*, but alſo the *Sclerotica* preternaturally diſtended, and enlarged to a great degree; and then the Diſorder may be alſo denominated *Staphyloma*, becauſe thoſe two Coats, the *Cornea* and *Sclerotica*, are properly conſtituted but of one; however it may be juſt to diſtinguiſh thoſe Tumors from each other, according to the different Parts affected, by denominating one of them *Staphyloma Scleroticæ*, and the other *Staphyloma Corneæ*. Kinds.

III. A *Staphyloma* is a dangerous Diſorder, as well becauſe it greatly deforms the Eye, and deſtroys its Sight, as becauſe it often induces moſt violent Inflammations, Headachs, Reſtleſſneſs, Abſceſs, and ſometimes a Cancer in theſe Parts; the Cure of it is therefore generally undertaken, not ſo much to recover the Sight, as to preſerve or reſtore the Uniformity of the Eye, and prevent the malignant Symptoms before enumerated. *Prognoſis.*

IV. In the Cure of this Diſorder we muſt relieve the Tumor and Deformity of the *Sclerotica* and *Cornea*, by the Application of a Compreſs dipt in *Aqua aluminis*, together with a Plate of Lead and Bandage, or ſome proper Inſtrument. If the *Uvea* protrudes itſelf through a Wound in the *Cornea*, it ſhould be returned by a Probe, the Patient in the mean time muſt lie in a ſupine Poſture, and the Wound be conſtantly dreſſed with the white of an Egg, or Mucilage of Quince-ſeeds, till it is healed; by which means the Patient often recovers his Sight. Cure of a recent *Staphyloma*.

V. If the Diſorder is become inveterate, and inflexible to all Remedies, you muſt paſs a Needle armed with a double Thread through the middle of the Tumor, as in *Fig.* 8. *Tab.* XVIII. Then the two Ends of the Thread are to be tied together in a knot, firſt on one ſide, and then on the other, by which means the Tumor will gradually wither, and at length fall off together with the Threads. Cure of an inveterate *Staphyloma*.

VI. But as this Ligature frequently occaſions violent Pain, Inflammation, and ſometimes a Suppuration of the Eye; it would ſeem to be a more ſafe and expeditious method to extirpate the Tumor by the Sciſſors or *Scalpel*. In this manner I myſelf once cut off a Protuberance of this kind at the Root, from the Eye, of the length of one's Finger, by a pair of Sciſſors. Another method.

VII. M.

The method of M. St. Yves.

VII. M. St. Yves's method of removing these Protuberances, when they have not wholly covered and obscured the *Cornea*, is to pass a crooked Needle and Thread of Silk through the middle of the *Staphyloma*; and, after removing the Needle, he twists together the Thread, and extends them with his left Hand, while with a *Scalpel* or Lancet he frees the Tumor under the Ligature, till he can at length totally extirpate it by the Scissors. Lastly, he applies a Compress over the disordered Eye, dipt in *Sp. Vini*, diluted with Water, as was observed in treating of the Cataract. And thus not only the *Staphyloma* is removed, but the *Cornea* itself becomes perfectly healed, or else leaves but a very small Aperture in the middle of the Wound; from whence indeed the aqueous Humour is continually discharged as fast as it is secerned in the Eye, but without any Trouble or Uneasiness to the Patient, because it flows gently with the Tears through the lacrymal Passages into the Nose.

A second method of St. Yves.

VIII. When the whole *Cornea* is infested with a *Staphyloma*, as in *Fig.* 4, 5, 6, 7, the most expeditious method of Cure is that of St. Yves, by cutting out circularly not only the *Cornea*, but also the *Iris* or *Uvea*, all round within a Line of the Ring, by which it touches the *Albuginea*; after which, all the Humours of the Eye falling out, the remaining Coats contract themselves into a smaller Compass, and the Wound itself will gradually heal up; and then you must arm the Patient with an artificial Eye, adapted in Size, Shape, and Aspect, to supply the Place of that which is wanting. In this manner the artificial Eye may frequently be moved from one Side to the other by the remaining Muscles of that Organ, so that many cannot discern it to be an artificial, but will take it for a true or natural Eye: And in this last method I myself have cured the *Staphyloma*.

CHAP. LX.

Of the Hypopion.

Description.

I. WE frequently meet with a Collection of purulent Matter immediately under the *Cornea*, in the Place of the aqueous Humour; which Disorder is generally denominated *Hypopion* or *Piosis* [a]. The *Hypopion* arises from an Extravasation of Blood or Matter in this Part, which may happen after a violent Inflammation, the Small Pox, couching a Cataract; or from other external Injuries of the Eyes from Violence, as Contusion, from a Blow or Fall, a Burn, &c. It is at the beginning very often attended with excruciating Pains both of the Head and Eyes; and, according to the degree of Injury, is soon after followed either with Blindness and a Destruction of the Eye, or Death itself.

[a] Indeed M. St. Yves names this Disorder of the Eyes *Onyx*; the *Hypopion*, according to him, being a Suppuration in the *Tunica Cornea* itself; so that an *Onyx*, or *Unguis*, may arise from an *Hypopion*, when the Matter of the last erodes into the *Cornea*, by destroying its internal *Lamella*. See his Treatise *De Morb. Oculor.* Part II. Cap. IX. Pag. 221. *& seq.* Hence we may see how much even some of our modern Surgeons and Oculists are at variance in their ascertaining the Disorders of the Eyes and their Names.

II. There

II. There are chiefly three methods of treating this Diſorder, the firſt and mildeſt of which is by diſperſing the Matter with diſcutient Remedies; ſuch as the Application of Compreſſes dipt in a Decoction of Sage, Eyebright, Hyſſop, and Fennel-ſeeds in Wine, or of little Bags ſtuffed with the ſame Ingredients, and boiled in Wine, which are to be frequently renewed; by which means, when the Blood or Matter is in no great Quantity, the Eye recovers its former Integrity and Action, as I have frequently experienced. Therefore you ſhould continue the Patient in this method ſo long as you find any Benefit from it, even till the corrupt Matter or Blood is all diſſipated or diſperſed. But if the Pain and other Symptoms are rendered more intenſe by theſe Applications, you muſt proceed immediately to the Operation; otherwiſe there will be great Danger of the contained Matter's eroding the *Cornea*, and deſtroying the internal Parts of the Eye, which will induce Blindneſs, after the moſt intenſe Pains.

Cure by agitating the Head.

III. But before we treat of the Operation, it may be proper to deſcribe the method of Cure which, we read, was formerly uſed with Succeſs by JUSTUS, an eminent Oculiſt in the Time of GALEN, who himſelf was an Eye-witneſs of his Practice, as he writes in the End of his 14th Book *De Methodo Medendi*. In the firſt place he ſeated the Patient on a ſort of Chair over-againſt himſelf; then taking hold of his Head with both Hands, he ſhook it about very aſſiduouſly, till all the purulent Matter diſappeared; in which Operation it is very remarkable, that GALEN himſelf teſtifies the Spectators could perceive the corrupt Matter gradually ſubſiding to the bottom of the Eye. Moſt People will be apt to reject this Method as uſeleſs and ridiculous; but my Opinion is, that it may be often very effectual in removing the *Hypopion*; in which I am confirmed, not only by the Authority of GALEN, but alſo from my own Experience in a Patient who, being juſt entered under my Care for an *Hypopion*, was obliged to take a Journey in a Chariot, by the repeated ſhaking and jolting of which, upon his Return the next Day, I found all the purulent Matter diſperſed; and, without doubt, it was ſubſided or thrown down behind the *Uvea*. It may therefore not be improper to try this Practice before the chirurgical Operation by the Hand and Inſtruments: But before you ſhake the Head, it will be proper to diſpoſe it, or the Patient's whole Body, in a ſupine Poſture, and to preſs the Eye firſt with the Fingers, in order to looſen and remove the Matter. But when the Diſorder is great and obſtinate, the purulent Matter being too copious, or too firmly fixed to be diſperſed in this manner, recourſe muſt then be had to the Operation long ago deſcribed and recommended by GALEN, ÆTIUS, and others of the Ancients; but has met with ſo much Neglect among our modern Surgeons and Oculiſts, that it would ſcarce have been known or heard of at preſent, if it had not been reſtored in the laſt Century by RIVERIUS MEEKREN, NUCKE, and BIDLOW.

Method of operating.

IV. Preparatory to the Operation, your Patient muſt be placed and ſeated againſt the Light, with his Head and Hands firmly ſecured each by an Aſſiſtant, as in couching a Cataract. Then the Surgeon himſelf depreſſes the lower Eyelid, while an Aſſiſtant elevates the upper. The Operator now takes a Lancet, and therewith cautiouſly incides through the *Cornea*, below the Pupil, and about the Space of a Line from the *Albuginea*, making his Apertion big enough to diſcharge the Matter with the aqueous Humour, but with Caution

at the ſame time to avoid wounding the *Uvea* behind the Matter. If the Matter does not diſcharge freely of itſelf, you muſt aſſiſt it by a gentle Preſſure and Agitation with your Fingers; and in about three or four Hours after the Operation, you muſt dreſs the Eye with a Compreſs dipt in *Collyrium ex Aq. Roſar. & Albo Ovor.* or a Mucilage *ex Sem. Cydoneor.* prepared, either of them, with or without Camphor. By this means you will find the Wound in the *Cornea* quickly healed, and the aqueous Humour ſoon after reſtored, with the Patient's Sight, if none of the internal Parts are injured. And though there may remain a ſmall *Cicatrix* in the *Cornea*, yet that being made lower than the Pupil, will cauſe very little, if any, Impediment to the Sight. In the mean time, to perform this Operation with the Lancet ſafely, you ought to involve that Inſtrument in Lint, or a Piece of Plaſter, ſo as to leave not above a Straw's breadth of its Point uncovered, that it may not run too far into the Eye. MEEKREN has on this Account invented an Inſtrument purpoſely for the Operation, publiſhed in the tenth Chapter of his chirurgical Operations, and delineated in our *Tab.* XVIII. *Fig.* 10.

Another method of Cure.

V. Sometimes the purulent Matter is found too much inſpiſſated, to be eaſily diſcharged through the Inciſion made by the Lancet in the *Cornea*; and in that Caſe it will be more convenient to uſe the Needle, *Tab.* XVIII. *Fig.* 12. which we have elſewhere propoſed for making Setons. For the recurve Point of this Needle is not only leſs apt to wound the *Uvea*, but, by its triangular Figure, it alſo makes a larger Aperture, which will more readily diſcharge the inſpiſſated Matter; but then we uſually involve this Needle almoſt up to its Point in a Slip of ſome Emplaſter, as I before adviſed you to do the Lancet. PLATNERUS has given us the Figure of a particular Inſtrument for this Purpoſe, having a ſort of triangular *Apex*, the Invention of which he aſcribes to Mr. WOOLHOUSE: See our *Tab.* XVIII. *Fig.* 13. When the Matter included under the *Cornea* is too thick to flow out of itſelf, or by Preſſure, Mr. ST. YVES propoſes to waſh it out by injecting with a ſmall Syringe, repeating the Operation every Day, till it be all removed; and then you may proceed to heal the Wound in the *Cornea*. If any Inflammation appears, the Patient ſhould be bled, bliſtered, ſcarified, and the affected Parts treated with a diſcutient Fomentation, and other proper Medicines.

CHAP. LXI.

Of inciding the Cornea, *to diſcharge extravaſated Blood.*

When the Operation is neceſſary.

I. BLOOD extravaſated in but a ſmall Quantity from external Violence, or Injuries offered to the Eye, may be generally diſperſed and carried off by the diſcutient Remedies before propoſed at N° II. of the preceding Chapter. But when the Quantity is larger than can be thus removed, you ought immediately to open the *Cornea* by Inciſion, as we directed in the preceding Chapter, to prevent the ſtagnant Blood from ſuppurating and deſtroying the Eye.

II. But

II. But leſt any body ſhould think I propoſe of my own Head a raſh and undeard-of Practice, I ſhall give the Reader an Inſtance of it (from the *Hiſt. Acad. Pariſ.* An. 1709. Pag. 16. Edit. *Amſtel.*) in which it ſucceeded very well. Therefore whenever any Perſon has, by ſome external Violence, had ſo much Blood extravaſated in his Eye, as to deſtroy his Sight, and be incapable of Diſperſion, it is the Advice of the Phyſician GANDOLPHUS, to have recourſe to this Practice. He therefore inſtantly made a tranſverſe Inciſion through the *Cornea*, and by that means happily diſcharged the extravaſated Blood, in ſuch a manner that the Patient was cured with hardly any Pain, and without any deforming *Cicatrix*, ſo that he recovered his former Sight without any Defect; and notwithſtanding this, he was obliged to perforate the *Cornea* three times, by reaſon of the Quantity and ſtrong Adheſion of the Blood. To promote the healing of the Inciſion, he, for the Space of eight Days, applied Compreſſes dipt in a Mixture of *Aq. Plantag.* ℥iv. & *Aq. Vulneraria* ℥ij. ſo that, in little more than a Week's time, the Cure was ſo well performed, that one could perceive no Difference betwixt the Eye that had undergone the Operation, and the other which had not, excepting only that its Pupil was a little larger than the other, which ſeems to have been rather the Effect of the Blow than of the Operation. An Inſtance of this Practice.

CHAP. LXII.

Of the Diſtenſion and Prolapſus Oculi, *alſo the* Fungus *and* Cancer.

I. SOMETIMES the Eye is ſo violently inflamed and ſwelled, that it cannot be contained in its Orbit or Socket by the Lids, but protrudes itſelf out of its natural Seat. This is a Diſorder attended not only with great Deformity, but alſo intenſe Pains, and frequently Blindneſs, or an obſtinate Cancer. How ghaſtly the Diſorder appears, may be perceived, I think, from the Figures we have given of it in *Tab.* XVIII. *Fig.* 14, 15. PAREY mentions a Caſe he ſaw, in which the Eye was ſo vehemently diſtended by pernicious Humours, that it at laſt burſt out of its proper Coats; and the like may be alſo ſeen in MUYS, *Dec.* II. *Obſ.* I. This is termed by the *Greeks* a *Proptoſis*, and by the *Latins* a *Prolapſus Oculi*; but ſometimes it is denominated an *Hydrophthalmia*, when the Eye is very much diſtended with a watery Humour; but the more modern Authors have, from its Similitude, named the Diſorder *Oculus Bovinus aut Elephantinus*. Though I muſt confeſs that many of theſe Names are rather intended to ſignify different Diſeaſes than one and the ſame; whence Error and Confuſion. The Cauſes of this Diſorder are various, being ſometimes from a violent Inflammation, or a Redundancy of Humours in the Eye, from an Obſtruction of the reductory Veſſels; ſometimes from a *Scirrhus*, Cancer, or ſome external Violence. The Inſtances given us by HILDANUS, *Cent.* I. *Obſ.* I. MUYS, *Dec.* XII. *Obſ.* I. and by me, in *Tab.* XVIII. *Fig.* 15. ſeem to have been from a Cancer: And more Inſtances of the ſame kind may be ſeen in STALPART, VANDER-WIEL, *Part* II. *Obſ.* IX. and in the other Writers of Obſervations. Laſtly, there are ſome Surgeons and Phyſicians who denominate this Diſorder *Ficus* or *Fungus*, which are in reality different Diſeaſes. Nature of the Diſorder.

Cure by Diſcutients or Puncture.

II. When the Diſorder is recent, and the Figure of the Eye is not yet deformed, thoſe Humors, producing the *Hydrophthalmia*, may be generally diſperſed by Bleeding, Purging, and Veſicatories, with internal Attenuants and Diluents, and external diſcutient Fomentations. But if the Caſe is too obſtinate to yield to Remedies, you muſt have recourſe to the chirurgical Operation of *Paracenteſis*, as in other dropſical Caſes; which *Paracenteſis* muſt be made either with a Lancet, or a ſmall *Trocar*, to diſcharge the offending Humours, repeating the diſcharge every day, or every other day, or as often as ſhall be found neceſſary. At every Dreſſing, a concave Plate of Lead ſhould be firmly ſecured upon the Eye, to recover its natural Figure. By carefully obſerving this method, NUCKE [a] cured a Patient of an *Hydrophthalmia*, though he made his *Paracenteſis* in the *Cornea* itſelf: But as that may leave an ugly *Cicatrax* in the *Cornea*, I rather make my Perforation with a Lancet in the *Sclerotica* than in the *Cornea*; and, after diſcarging the Humours, I dreſs the Eye with Lint dipt in *Aq. Roſar. & Album Ovor. permiſt.* defend it with the leaden Plate, and then apply my Compreſs dipt in *Sp. Vini*; and laſtly, my Bandage, not neglecting Internals at the ſame time, till the Eye is cured, and recovers its State.

Cure by the *Scalpel*.

III. When the natural Figure of the Eye and its Office of Viſion are deſtroyed, and the Pains become more and more intenſe, there then remains but one, and a lamentable method, of relieving the Patient, by making a tranſverſe Inciſion through the Coats of the Eye, and diſcharging the contained Humours; which done, and the Eye deterged as in other Ulcers, you muſt cover the Eyelids with Compreſs and Bandage. But if, after the Humours are diſcharged, the Eye remains larger than can be eaſily covered with the Eyelids, it will be neceſſary to cut off ſo much as is redundant with the *Scalpel* or Sciſſors; by which means the Deformity may be afterwards the better concealed by an artificial Eye. Sometimes the Surgeon may cut out the *Cornea* by a circular Inciſion, in this Diſorder, as we propoſed in the *Staphyloma*, Chap. LVIII. preceding.

Another method of Cure.

IV. BARTISCHIUS, HILDANUS, and MUYS, have contrived a crooked *Scalpel*, excavated like a Spoon, for extirpating the Eye when it is thus diſordered; but, upon mature Conſideration, I believe the Surgeon will not ſtand in need of any ſuch Inſtrument: For, to ſay nothing of the Difficulty you will meet with in ſharpening and uſing ſuch an Inſtrument, it will be found, in moſt Caſes, ſufficient to extirpate only the redundant or tumified Part of the Eye, which prevents the Eyelids from cloſing; to which you may add, the Danger there will be of wounding and uncovering the thin Bones which compoſe the Orbit, by this crooked *Scalpel*. But if ever the Surgeon ſhall find it neceſſary to extirpate the whole Eye for a *Scirrhus*, or cancerous Diſorder of it, he may perform the ſame with equal Advantage by the ſtrait *Scalpel*, *Tab.* XII. *Fig.* 14. which is the ſame I uſed in extirpating thoſe ghaſtly Tumors of this kind, repreſented in *Tab.* XVIII. *Fig.* 14, *and* 15. Though there are ſome Surgeons who think it the mildeſt Practice to free the Eye ſo far from its Orbit by a *Scalpel*, till you can make a Ligature about the pro-

[a] Lib. *De Duct. Oculor. aquoſ.* Pag. 120. and VALENTINI in *Miſc. Nat. Cur.* Ann. VI. Obſ. LXX.

tuberant

tuberant Part, in order to remove it by that means like other Excreſcences; but the more prudent in the Profeſſion generally prefer any method to this, becauſe of the intenſe Pain, Inflammation, and Convulſions which, by this means, torture and often kill the Patient. Therefore whenever you meet with the Eye infeſted, even to its Root, with a *Scirrhus* or Cancer, there is no ſafer method of relieving the Patient from his painful Diſorder, than by extirpating it clean out from the Orbit, in the manner performed by HILDANUS and MUYS, deterging and healing the Wound afterwards in the uſual method.

V. It ſometimes happens in this Diſorder, that after having performed the Operation, a new fleſhy Excreſcence ſprouts up over the Eye, and forms a freſh Tumor; to prevent which, you muſt dreſs with Lint dipt in *Aq. Phagedænica*, and make a pretty tight Deligation over the leaden Plate with which you are to cover the Eye. It may be here alſo obſerved, that Cancers of the Eye, like the ſame Diſorder in other Parts, will very often return, after they have been ſeemingly cured by the Operation and Treatment here propoſed, and may be again removed by the ſame Practice; as may appear from the Obſervation of MUYS, before cited. Laſtly, when the Diſorder ariſes from a *Caries*, or *Spina ventoſa* of the Bones themſelves compoſing the Orbit, if it will not give way to Mercury, as it often does, the Phyſician muſt then be content to palliate the Diſorder, relieve the Pains, and prevent its bad Conſequences, ſince a total removal thereof is frequently altogether impracticable.

CHAP. LXIII.

Of Artificial Eyes.

I. THE Loſs of an Eye is frequently occaſioned by a Wound, an Abſceſs in the Small Pox, or an Operation in Surgery; and then the unhappy Patient is deſirous of concealing his Misfortune by an artificial Eye, which is contrived to hide the Deformity which this Accident would otherwiſe produce. The modern artificial Eyes are made of concave Plates of Silver, Gold, or Glaſs ſtained or enameled, ſo as to reſemble the natural Eye; ſee *Tab.* VII. *Fig.* 1. The nearer it approaches the ſound Eye in Size and Appearance, the more firmly it will ſtay under the Eyelids, and the more eaſily deceive the Spectator. But it will be frequently neceſſary for the Patient to wipe his artificial Eye clean, leſt if any Gum or *Sordes* ſhould gather upon it, the Fallacy might be thereby diſcovered; to prevent which, it may be alſo proper for him to be provided with ſeveral of theſe artificial Eyes, that if one ſhould happen to be loſt, broke, or disfigured, its Place may be immediately ſupplied with another. Upon going to Bed, it is proper to diſmount the artificial Eye, and to replace it again under the Eyelids, after he wakes in the Morning. But then, that the artificial Eye may be taken out and put in with Neatneſs and Conveniency, the Surgeon muſt take care to remove ſo much of the diſordered Eye, as will make room for receiving the artificial. Their Compoſition.

II. It is here to be obſerved, that the more cloſely the artificial Eye is compreſſed by the Eyelids, and by the diſeaſed Eye, the more perfectly it will perform the Motions of the natural Eye, which it will receive from the remaining Motion of the artificial Eye.

maining Muſcles which agitate the diſeaſed Globe. It is therefore not without Reaſon that we before adviſed the Surgeon to remove no more of the Eye than what was preternaturally projected beyond its anterior Part, except when a *Scirrhus* or Cancer ſhould require an Extirpation of the whole, and then indeed it cannot be expected that the artificial Eye ſhould have any other Motion than what it receives from the Lids.

It is ſometimes better to be without them.

III. I have ſeveral times obſerved ſome of theſe artificial Eyes produce Pain, Inflammation, Tears, and other Inconveniences, by irritating the Parts which are not of a proper Conformation, or when the artificial is not right ſhaped; ſo that they will often inflame, weaken, and deſtroy the Sight of the ſound Eye. In ſuch Caſes it will be beſt for the Patient either to provide himſelf with an artificial Eye which is better adapted, or elſe totally to relinquiſh the Uſe of them, rather than loſe the Uſe of both Eyes.

CHAP. LXIV.

Of the Strabiſmus, *or Squinting.*

Cauſes.

I. WE frequently meet with Perſons whoſe Eyes, when they look upon any thing, are diſtorted, or turned towards the outer or inner Corners of their Eyelids, inſtead of being directed towards the Object; which is the Diſorder commonly termed *Strabiſmus*, or *Squinting*. Sometimes only one Eye, but more frequently both, are thus affected. The Diſorder is frequently cauſed in Infants, from letting them conſtantly ſuck at one and the ſame Breaſt, or placing them in the Cradle, ſo that they always look the ſame Way towards the Light or Window; by which repeated Action, the Muſcles on that Side become too ſtrong and powerful to be balanced by the reſt, which antagonize them on the other Side of the Eye, which by that means is contorted, or looks obliquely. But this Diſorder is more frequently cauſed in Infants from convulſive and epileptic Motions, to which the Muſcles of their Eyes, as well as of their other Limbs, are extreamly ſubject. Laſtly, it may proceed as well in Adults as Infants, from a Spaſm and Rigor, or from a Palſy in one or two of the Muſcles of the Eye, as alſo from a Defect or Inſenſibility in ſome Part of the *Retina*; for when that Part of the *Retina* which is oppoſite to the Pupil, and receives the Impreſſion of the Object, is from any Cauſe rendered inſenſible, the Patient is then obliged to turn his Eye obliquely, till the Pupil directs the Rays from the Object upon ſome other ſound Part of the *Retina*, in order to ſee the ſame.

When and how it may be cured.

II. Squinting is a Diſorder which is hardly ever cured without Difficulty, more eſpecially when in Adults, and cauſed by ſome Defect in the Muſcles or *Retina* of the Eye: But in young Infants you will probably ſucceed, according to the Advice of M. St. Yves, by frequently placing them before a Looking-glaſs, that their Eyes may be directed towards the Image of their own Face. Thoſe more advanced in Years may be aſſiſted by reading very ſmall Writing, or inſpecting very minute Objects, provided you obſerve and direct them to turn

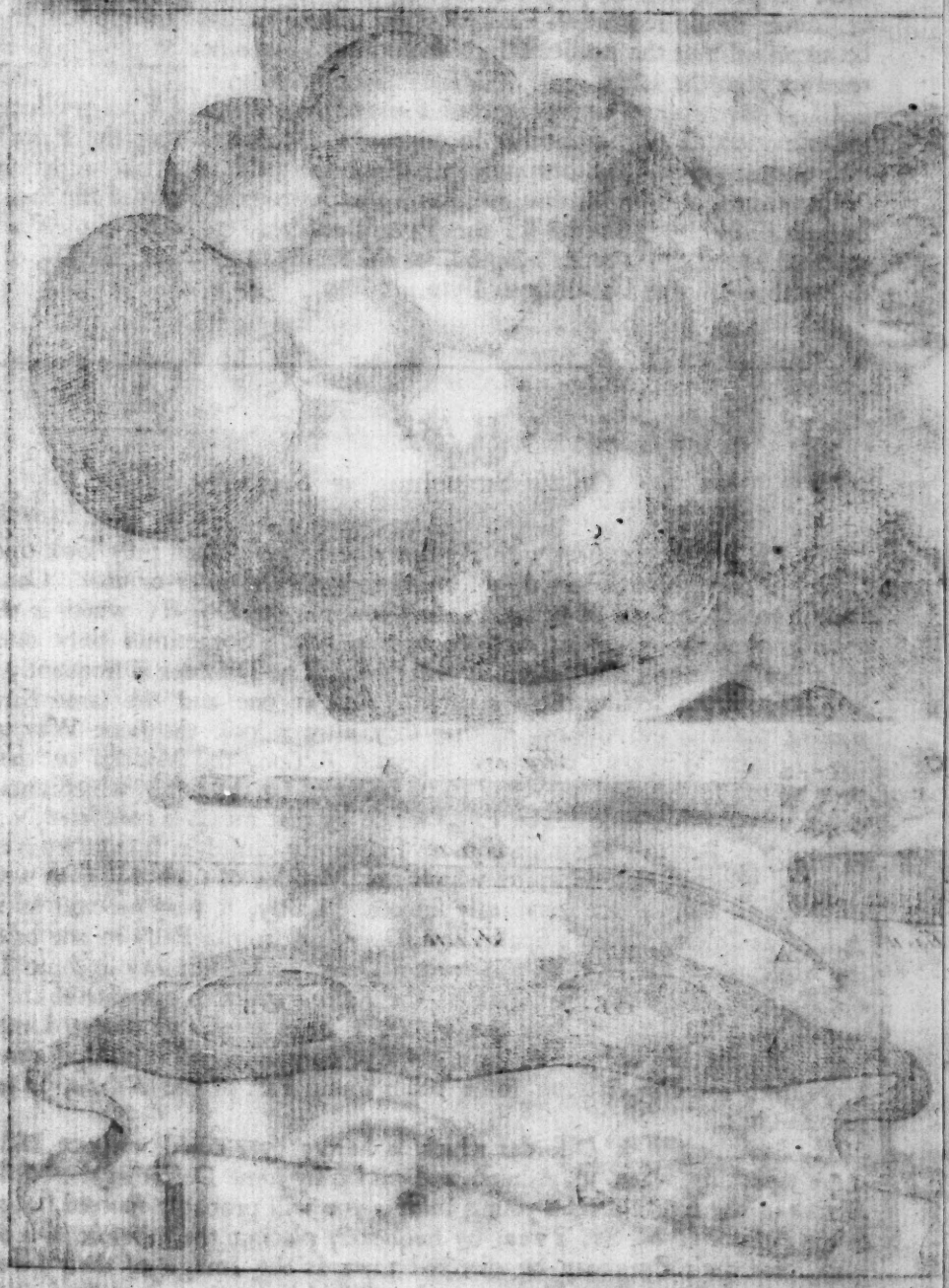


Plate 18.

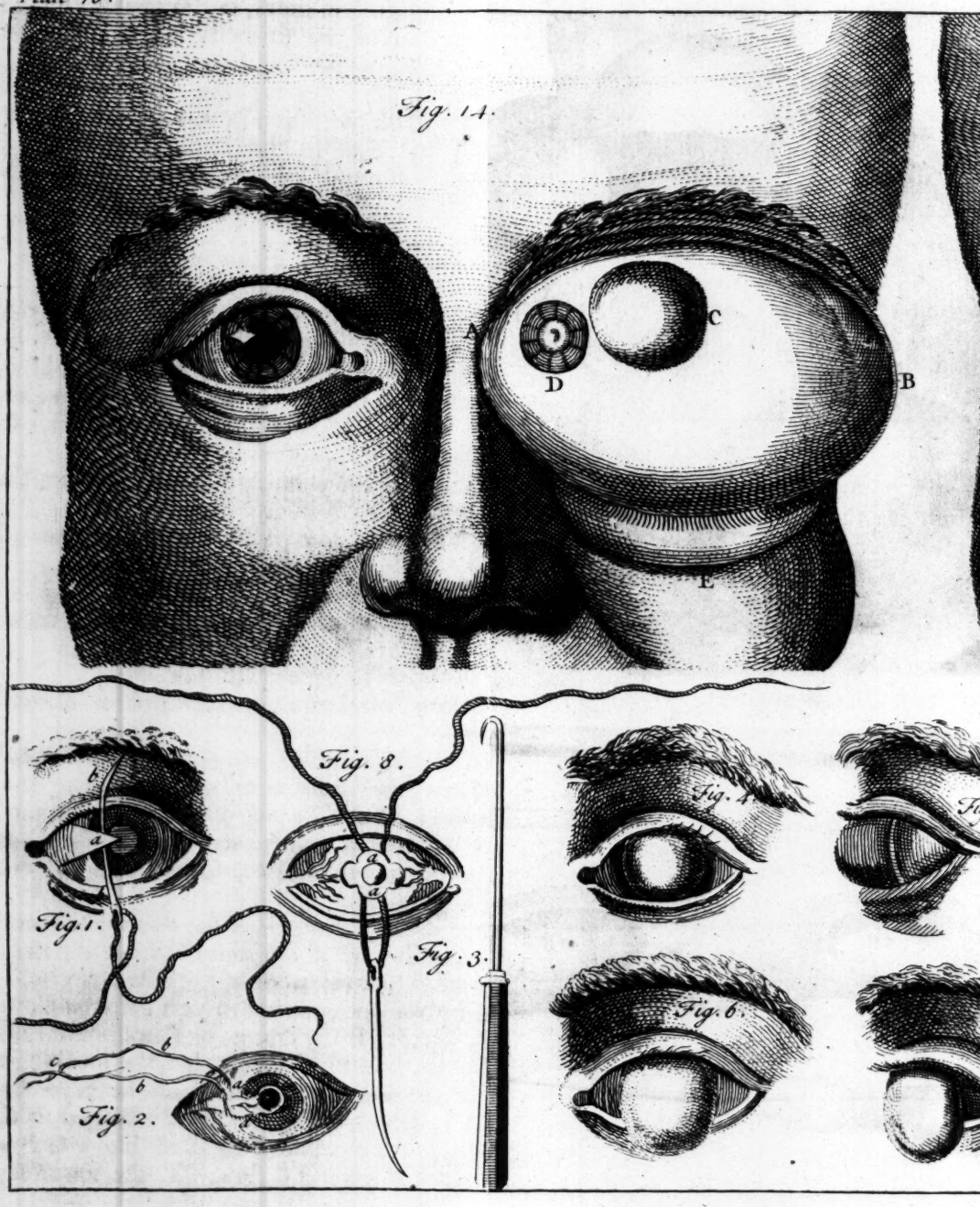


Fig. 15.

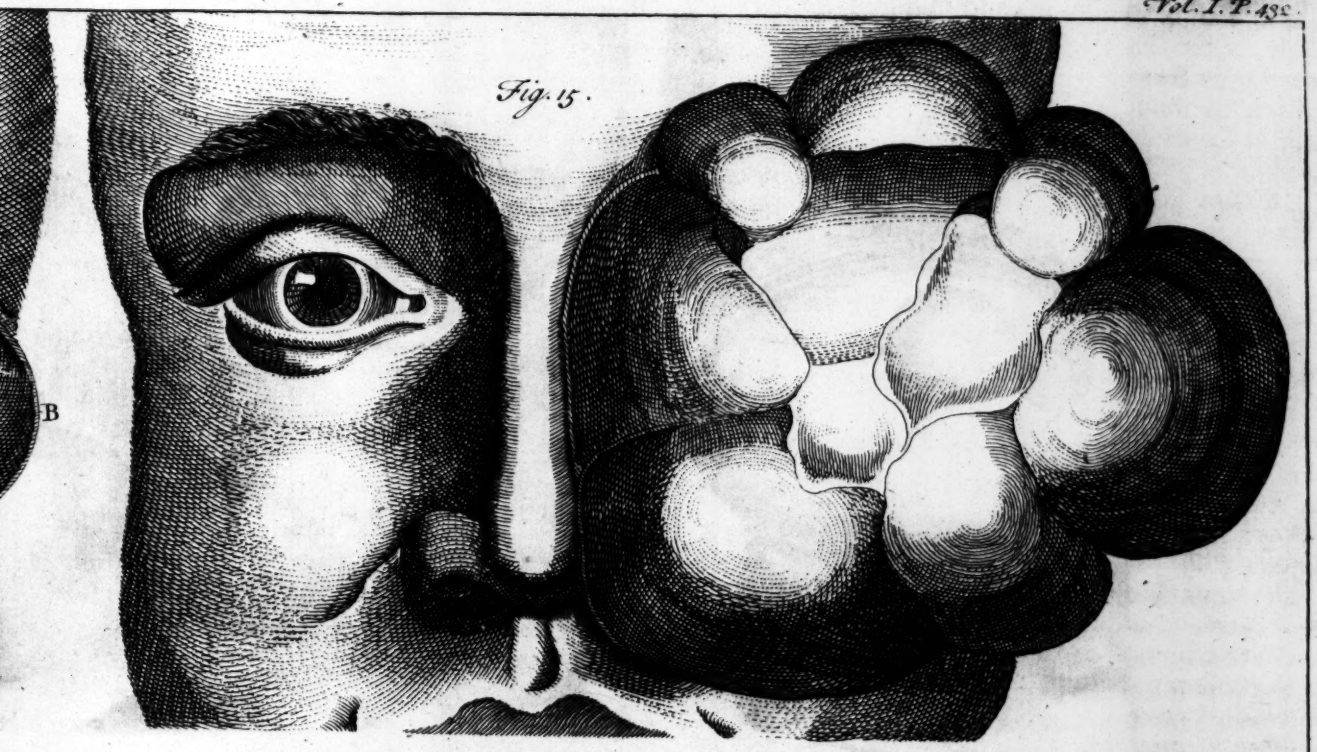


Fig. 5.

Fig. 7.

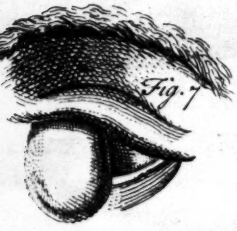


Fig. 13.

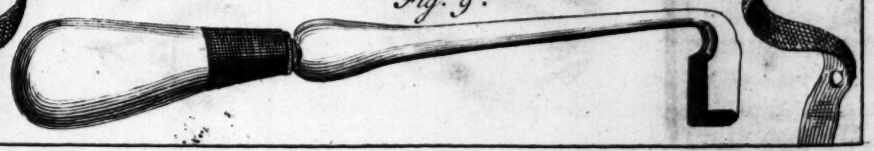
Fig. 10.

Fig. 11.

Fig. 12.

Fig. 16.

Fig. 9.



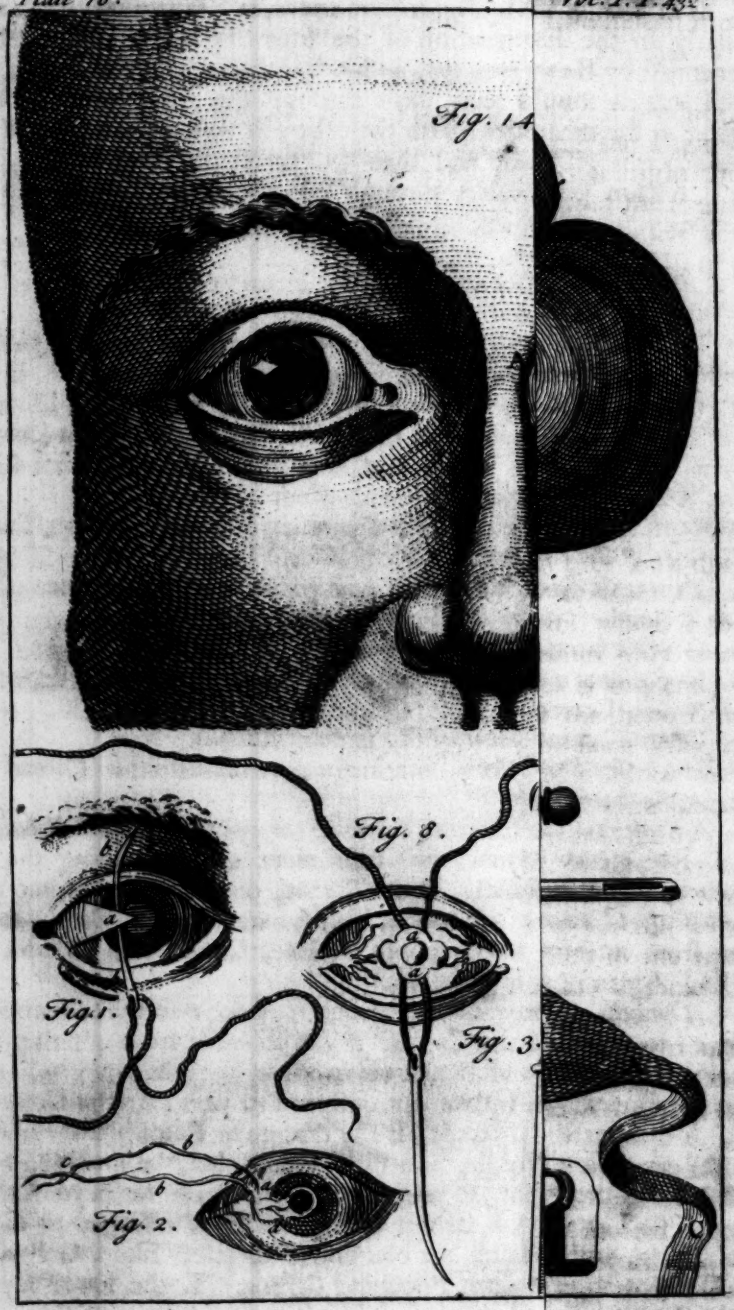


Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.

turn their Eyes even, and to bathe them at times with *Aq. Hungar.* There are others who propoſe to cure this Diſorder with a ſort of Maſk or Eye-Swath, as in *Tab.* XVIII. *Fig.* 16. taken from SOLINGEN, and deſcribed more particularly in the Explanation of the following Table. This method is alſo recommended by BARTISCHIUS, in his *Ophthalmoduleia*, Pag. 15, 16, *and* 17. But, leſt Infants ſhould look ſtrait through the Aperture with only one Eye, and ſquint in the mean time with the other, it will be beſt to bind up one Eye till the other is rectified, and then to correct the other in the ſame manner; which is ſeldom practicable, through Moroſeneſs of Infants, and other Impediments.

An EXPLANATION *of the* EIGHTEENTH PLATE.

Fig. 1. Denotes an *Unguis a* on the Eye, with the method of paſſing a Needle and Thread under it *b b*, for its removal.

Fig. 2. Repreſents another *Unguis*, or *Pterygium a a*, with a Thread tied round it *b b*, and at their Extremities tied in the Knot *c*, to form a Loop for extending and elevating the ſame; but that the Thread may not ſlide upon the Film, it is firſt tied with the double Knot *a*.

Fig. 3. Repreſents a Hook uſed in ſeparating Films, and other Tubercles, from the Eye.

Fig. 4. Denotes a front View of a *Staphyloma*, or Protuberance of the *Cornea*, which I cured.

Fig. 5. Gives a lateral View of the ſame *Staphyloma*.

Fig. 6. Repreſents a front View of another larger and more depending *Staphyloma*, which I cured.

Fig. 7. Gives a lateral View of the ſame.

Fig. 8. Is a leſſer *Staphyloma*, marked *a a*, with a double Thread paſſed under it, from SOLINGEN.

Fig. 9. A *Scalprum*, to ſcrape or exfoliate *carious* Bones in the *Fiſtula lacrymalis*.

Fig. 10. Repreſents MEEKREN's Inſtrument for perforating the *Cornea* in an *Hypopion*, A A the Handle, B the *Scalpel*, or rather the Point of a double-edged *Scalpel*, having a Button or Protuberance at its Baſis, to prevent the Point from entering too deep into the Eye, C the Screw by which the *Capſula* or Caſe, *Fig.* 11. is faſtened on.

Fig. 11. Denotes a large Needle which may ſerve to make Setons, but is here deſigned to perforate the *Cornea*, if you ſecure it from entering too deep, by involving it in a Slip of Plaſter up to A.

Fig. 12. Repreſents an Inſtrument deſigned to perforate the *Cornea* in an *Hypopion*, A denotes the Handle, B the triangular Point a little crooked, almoſt like the preceding Needle, and ſhould, like that, be involved with a Slip of Plaſter up to the Point, to prevent its entering too far beyond the *Cornea*.

Fig. 13. The Letters A B denote a ſcirrhous Eye, enlarged to the Size of an Hen's Egg, upon which is a blackiſh Tubercle, like a Grape, marked C, and D denotes the vitiated Pupil and *Cornea*. E the lower Eyelid depreſſed by the Tumor.

Fig. 14.

Fig. 15. Denotes a large *Fungus* of the left Eye, weighing half a Pound, which, with the preceding, I extirpated and cured in 1721. The particular Nature and Treatment of which I ſhall deſcribe in my *Chirurgical Obſervations*, which I intend ſhortly to publiſh.

Of Diſorders in the Ears.

CHAP. LXV.

The Apertion of a cloſed Meatus Auditorius.

THE *Meatus auditorius* is ſometimes cloſed from the Birth with a Membrane differing in degrees of Thickneſs; formed ſometimes immediately after the Birth, and ſometimes a conſiderable while after, when the Child ſhould begin to talk; for Deafneſs and Dumbneſs almoſt conſtantly go together. If the Child be therefore obſerved not to talk ſo ſoon as uſual, the Diſpoſition of the Ears and Tongue ought to be examined; becauſe very often one may meet with ſome Impediment in the Ear, which may be ſometimes removed with more or leſs Difficulty, as it is ſeated more or leſs ſuperficially. When the external Ear is cloſed by a Membrane, its Faculty of hearing may be reſtored by removing the Membrane, which may be done without Difficulty when ſuperficial; but when it lies very deep in the Ear, 'tis a more dangerous Caſe; becauſe in perforating or removing the preternatural Membrane, you are liable to wound the Membrane of the *Tympanum* at the ſame time. When the occluding Membrane is not ſeated too deep, you may make a cruciform Inciſion through it, and keep the Paſſage open with Lint or a Tent as long as you ſhall ſee neceſſary, and thus you will probably cure the Patient both of his Deafneſs and Dumbneſs; but when the ſaid Membrane is ſeated very deep in the Ear near the *Tympanum*, the Succeſs of your Operation will be very hazardous; yet you ought notwithſtanding to attempt it, ſince he can but be as he is, without his Hearing, if you do not ſucceed. You may divide the preternatural Membrane either by a tranſverſe or longitudinal Inciſion, taking care that you do not at the ſame time wound the Membrane of the *Tympanum*, which in Infants is not ſeated ſo deep in the Ear as in Adults.

CHAP. LXVI.

Of extracting of foreign Bodies out of the Ears.

THE Hearing is frequently impeded by an indurated Lump of the Ear-wax, or by a Pea, Cherry-ſtone, Inſect, or the like, having ſlipt into its Cavity. Theſe are to be extracted upon two Accounts, firſt becauſe they give the Patient great Pain and Uneaſineſs, and, Secondly, becauſe they deſtroy his Hearing. You may know of what kind the offending Body is, partly from the account of the Patient, and partly from inſpecting and ſearching with your Probe, or ſome other Inſtrument. When the Accident ariſes from a Lump of dried and indurated Ear-wax obſtructing the Patient's Hearing, it will be beſt to inject ſome warm Milk, or Oil of Olives or Almonds, ordering the Patient to

to hold his Head inclined on the contrary ſide while you uſe the Syringe. But the *Cerumen* of the Ear is often too much indurated to be mollified and diſcharged at one Operation; and therefore you muſt ſyringe the Patient ſeveral times till the Impediment is removed. If a ſmall *Calculus*, or a Cherry-ſtone be lodged in it, you muſt firſt of all relax and mollify the Paſſages of the Ear, by dropping in ſome warm Milk or Oil, and then carefully extract the Body with your Probe, or the Pliers repreſented in *Tab.* I. *lit.* E. But if the foreign Body ſhould happen to be a Pea, Bean, or ſome other Grain, which is too much ſwelled by the Humours to be diſcharged entire by the Probe, or other Inſtrument, you muſt break it with Pliers, or cut it with ſmall Sciſſors, and extract it by a bit at a time. Sometimes a Flea, or other Inſect gets into the Ear, and, by ſtruggling to get looſe from the glutinous Ear-wax, excites an intolerable *Pruritus* and Tickling, which in time turns to acute Pain; and theſe, when you can perceive them, may be drawn out by a Probe or Pair of Pliers; and, if theſe fail, you may inject warm Oil, or Spirit of Wine, which will quickly kill the Inſect, and then you may waſh it out with the ſame, or ſome other Liquor, and afterwards cleanſe the Cavity of the Ear with a bit of Cotton or Lint upon the End of your Probe. There are ſome who recommend bitter Infuſions or Decoctions of Wormwood, *Colocynthis*, *&c.* to be injected into the Ear, to deſtroy the Inſects; but, in my Opinion, warm Oil, or Spirit of Wine, is much fitter for this Purpoſe than any other Liquor. For though Bitters quickly kill ſome Inſects, yet there are others which ſeem to be delighted with them; but I know not of any Inſect which is not quickly deſtroyed in Oil, or Spirit of Wine.

CHAP. LXVII.

Of Tubercles in the Meatus Auditorius.

MANY Patients are troubled with Tubercles, or fleſhy Excreſcences in the auditory Paſſage of their Ears, which give them great Uneaſineſs, and do partly, if not totally obſtruct their Hearing. When they are not of long ſtanding, you may remove them with Eſcharotics, if you firſt arm or defend the auditory Paſſage, by filling it with Lint or Cotton, that none of the Cauſtic may touch the Membrane of the *Tympanum*; to avoid which it will be preferable to extirpate them by the Sciſſors or *Scalpel*, when they are not ſeated too low in the Ear. If theſe Tubercles are too much concealed in the Cavity of the Ear to be conveniently removed by the *Scalpel* or Sciſſors alone, you may extend and elevate them with a Hook; or if they are very acceſſible, and the Cauſtic does not take Effect, you may apply the actual Cautery with Succeſs. Laſtly, it is apparent, from the Obſervations of HILDANUS (*Cent.* 3. *Obſ.* 1.) and PURMANNUS (*Chirurg.* pag. 280.) that theſe Tubercles may be frequently removed with Succeſs by Ligature. Conſult the Caſes related by thoſe Authors, which are illuſtrated with Figures.

CHAP. LXVIII.

Of Cauteriſing behind the Ears for the Tooth-ach.

IT has been obſerved by NUCKE, SOLINGEN, DEKKERS, VALSALVA, and many other ingenious Phyſicians, that obſtinate Pains of the Teeth, which could be relieved by no Medicines whatever, have yet been ſpeedily removed by cauteriſing behind the Ear, underneath that Protuberance which is termed *Antitragus*. The Authors before-mentioned have deſcribed and figured the Cautery with its Caſe for this Operation, as you may ſee in our *Tab.* XIX. *Fig.* 1. but, in my Opinion, a common Nail, or bit of Iron Wire, would do as well. It is indeed remarked by the celebrated Anatomiſt and Phyſician SPIGELIUS, that SCULTETUS happily cured the Tooth-ach by cauteriſing the Part mentioned by plunging a red-hot *Scalpel* into it; and VALSALVA aſſerts, that he has had equal Succeſs barely from making an Inciſion in this Part without heating the *Scalpel* at all. But what ſhould occaſion ſo ſudden a Removal of the Tooth-ach from this Practice? Some will anſwer, it is by burning or dividing a Nerve which paſſes from this Part of the Ear to the Teeth, which muſt conſequently make them inſenſible of Pain; but, for my own Part, I muſt confeſs, when the Patient is ſo ſuddenly relieved by this Practice, I think it rather proceeds from the Fright, than from the Cauteriſation of any Nerve, ſince we cannot find any that paſſes from thence to the Teeth; and I know it is not an unuſual Thing for a very intenſe Tooth-ach to vaniſh at the Patient's Sight of the Surgeon's Inſtrument, with which the Tooth is to be drawn. Laſtly, I muſt not omit obſerving, that notwithſtanding what others affirm, I have often tried this Practice without the deſired Succeſs; and therefore it will not anſwer to the Character given of it by its Patrons.

CHAP. LXIX.

Of Acouſtic Inſtruments to help the Hearing.

AS a weak Sight may be rendered ſtronger by concentrating the luminous Rays to the Eye with Glaſſes, ſo the Hearing may be alſo aſſiſted by collecting and concentrating the ſonorous Rays by acouſtic Inſtruments. There are ſeveral ſorts of theſe Inſtruments, but all of them bear a Reſemblance to the Trumpet; that ſort which is found to be the beſt and moſt commodious, is that in *Tab.* XIX. *Fig.* 2. beginning with a ſmall *Apex*, and ending in a broad *Baſis*, the whole being a little crooked. Thoſe are alſo highly recommended by NUCKE and DEKKERS, which we have repreſented at *Fig.* 3, and 4. The two former of theſe at *Fig.* 2 and 3. are uſed by fixing the ſmall End A into the Cavity of the Ear, holding the Part B in your Hand. The third and laſt of theſe Hearing-trumpets is much the ſmalleſt, and made in the Shape of a Snail's Shell, and is, by DEKKERS, recommended for its Conveniency above the former, becauſe, by its Smallneſs, it may be placed under the Cap or Wig without being ob-

obſerved, and then you faſten it by Strings round the Ear. But Experience teaches us, that the firſt of theſe Inſtruments is the beſt, though the moſt ſimple, and leaſt expenſive. It was reported a few Years ago in the public News, that one TRUCHET, a Mathematician and Monk in *France*, Fellow of the Royal Academy, had, by his great Ingenuity, contrived at *Paris* an acouſtic Inſtrument ſo ſmall, as to be concealed under one's Wig, and yet ſo powerful, as to augment the Hearing beyond all Belief. But I have never yet been able to learn, by Letters ſent to my Friends at *Paris*, and others, any thing at all concerning the Truth, Make, or Uſefulneſs of this Inſtrument; yet I think Mechanics ought to be encouraged to greater Diligence in theſe ſort of Machines, becauſe they may redound to the general Uſe of Mankind. We have a kind of ſilver Trumpet gilt, of a Span's Length, propoſed a few Years ago by REUSNERUS for Deafneſs, Pains, and Tinglings in the Ears, (*Ephem. Nat. Cur. Cent.* V. *Obſ.* VI.) which he orders to be inſerted twice a Day into the Ear, and thereby to ſuck out the foreign Air which offends that Organ; which is too whimſical to need any farther Notice. In the mean time I muſt recommend the firſt Tube in Shape of a Horn, *Fig.* 2. as the beſt and moſt commodious Inſtrument we are yet furniſhed with, to aſſiſt thoſe who are hard of Hearing, which may be made either of Silver or Braſs.

CHAP. LXX.

Of Boring the Lobes *of the Ears.*

TO bore or perforate the *Lobes* of the Ears, you muſt firſt of all mark the Place with a Spot of Ink, which ſhould be generally in the Middle, and then with a common large Needle, after extending the *Lobe* betwixt your left Fore-finger and Thumb, you perforate it in the Mark, and then inſert an Ear-ring, or the ſmall Plummit of Lead, *Tab.* XIX. *Fig.* 7. bending it into a Ring after it is introduced; this you dreſs two or three times a Day with *Oleum ovor. aut Hyperici*, and gently ſhift or draw it round through the Puncture till it is healed: But for Ear-rings it is generally better to perforate a little higher than the middle of the *Lobe*, leſt it ſhould be lacerated, or cut through by them. To perform this Operation with little Trouble to the Surgeon, and leſs Pain to the Patient, we are furniſhed with an Inſtrument for compreſſing and ſecuring the *Lobe* of the Ear before and while you perforate it, as in *Tab.* XIX. *Fig.* 5. The two Cheeks of the Inſtrument are applied, ſo that the *Foramen* B covers the Spot of Ink on the *Lobe*; then the Ring A is thruſt upwards, ſo as to compreſs the Part, and render it leſs ſenſible; you next perforate the *Lobe* with a Bodkin of Silver, or Gold, or rather with a Steel Needle almoſt like the common ſort, only furniſhed with a Cavity in the obtuſe End, as in *Fig.* 6. AB, to introduce the leaden Plummit, *Fig.* 7. which is then left in the Ear, and ſhifted round, as I before directed, till the Puncture is healed. Inſtead of the laſt mentioned Needle, others uſe one with the obtuſe End ſlit, like the larding Needle of Poulterers, as at *Fig.* 8. which more readily introduces the leaden Plummit, which is to be placed in the Slit, when the Needle has gone half through. Though

this Operation is, for the moſt part, rather ſubſervient to Pride and Ornament than any Uſe in Phyſic, yet if we may credit RIVERIUS (*Obſ.* 100.) and ſome others, it proves of very great Conſequence againſt ſeveral Diſeaſes. For, ſays RIVERIUS, the Revulſion made by paſſing a red-hot triangular Needle through the *Lobe* of the Ear, and the great Diſcharge made by drawing a Thread of Silk or Linen through it, cannot but expel and divert peccant Humours from the Eyes, Teeth, *&c.* and may even vanquiſh a *Tabes*, and the moſt obſtinate Diſorders of the Breaſt. We therefore need not ſo much wonder ſome Oculiſts and others ſhould have made this Operation more common of late than it was formerly; ſince it is not only countenanced and approved of by RIVERIUS, but alſo PARACELSUS and M. A. SEVERINUS (*Lib. de Effic. Medic.* pag. 73.) judge it to be an uſeful Operation to relieve an incipient Deafneſs.

Of Chirurgical OPERATIONS in the NOSE.

CHAP. LXXI.

Of a Polypus *in the Noſe.*

Deſcription and Kinds.

I. THE internal Parts of the Noſe are, like many other Parts of the Body, frequently infeſted with fleſhy Excreſcences, which, in this Organ, we uſually term *Polypuſes*; though we ſeldom find them to have more Feet or Roots than one. Some call them *Sarcomata*, others *Hyperſarcomata*. Theſe Caruncles are of various Sizes, and of different Conſiſtences; frequently they are ſoft, and ſometimes extenſible, or capable of Elongation, but, by Accident, they now and then turn out hard and rigid. Sometimes they appear paler, and ſometimes redder than uſual; but, in their Beginning, they are generally ſmall, and advance gradually, though ſome much faſter than others: And I have even obſerved ſome of them to grow ſo faſt, that, in three or four Days time, they have hung down out of the Noſe. Uſually they are not attended with Pain; but ſome of them, which are hard and livid, are extremely painful, inclining in ſome meaſure to be cancerous. Some are imperceptibly concealed within the Noſe, others hang out of that Organ down to the Lips, ſome fill up and much diſtend the Noſe; ſome again appear as one Caruncle with an even Surface, and others like a Cluſter [a]. Some of them deſcend backward through the Apertures by which we draw the Air through the Noſe into the Fauces, and grow ſo big as to be viſible behind the *Uvula*; and then they occaſion not only great Difficulty of ſpeaking and ſwallowing, but ſometimes almoſt ſtrangle the Patient. Sometimes again they extend themſelves both forwards through the Noſe, and backwards into the Fauces; but it is ſeldom that both Cavities of the Noſe

[a] GLANDORP, *de Polyp.* Cap. III. will have all *Polypuſes* to be unequal; which is not juſt, becauſe I have ſeen ſeveral otherwiſe.

are

are thus obſtructed. Generally the *Polypus* has but one Root, as we obſerved, which is ſometimes ſlender, and ſometimes thick, beſet with large Veins; not but that one may now and then by accident meet a *Polypus* having many Roots, whence the Ancients [a] ſeem to have denominated the Diſorder. Very often they ariſe from the lower, middle, back, and upper part of the Noſe [b], and ſometimes even from the *Os ethmoides*, or adjacent Sinuſes of the *Cranium*. But *Polypuſes* are moſt frequently formed in and from the pituitary Membrane, and particularly by an Obſtruction of one or more of its Glands, which being gradually enlarged by peccant Humours, at laſt fills the whole Noſe, or hangs down out of it; the Diſorder therefore ſeems to be nothing more than a morbid Diſpoſition of the ſpongy Production and Glands of this Membrane. So that in my Opinion this Diſorder is different from thoſe Caruncles in the Noſe, which are uſually termed *Sarcomata Naſi*; for a *Polypus* is generally ſoft, and hangs by a ſlender or thick Root as by a Stalk, like a Fig [c]; but a *Sarcoma* is more of a fleſhy Conſiſtence, and adheres by a large, firm, and immoveable Baſis.

II. Having deſcribed the Diſorder, and its kinds, we ſhall now examine the State and Condition of it, with the moſt uſual productive Cauſes. And, firſt, thoſe *Polypuſes* which appear whitiſh, or of a pale Red, being without Pain, are of a mild Nature; whereas thoſe are very bad which appear hard, painful, and of a black or blue Colour, or which diſcharge a purulent Matter, or fetid and acrid Humour, for ſuch are tending to a cancerous Diſpoſition. *Polypuſes* often ariſe from internal and latent Cauſes, and ſometimes from external Injuries or Violence. By the latent internal Cauſes we mean an Obſtruction in the ſmall Glands and Veſſels of the pituitary Membrane, from an infected or inſpiſſated Blood and Lymph; by a Congeſtion of which Humours that ſpongy Membrane may be eaſily diſtended or tumified. Under the Cauſes from external Violence we may reckon violent Falls or Blows, too frequent Intruſion of the Fingers into the Noſe, irritating or ſcratching the pituitary Glands, to which add ſternutatory Powders which are too ſtrong and acrid. Laſtly, among the internal manifeſt Cauſes, are too profuſe Hæmorrhages, Catarrhs or Defluxions, and Ulcers. *Sarcomas* are produced by much the ſame Cauſes, and both of them are often attended with a *Spina ventoſa*, or *Caries* of the *Oſſa Naſi*, of which deplorable Caſe I have ſeen ſeveral Inſtances. *Diagnoſis and Cauſes.*

III. The Danger is much leſs, and the Cure more eaſy in *Polypuſes* of the mild Diſpoſition, as are thoſe ſeated not very far in the Noſe, being ſoft, pendulous, extenſible, and ſupported by a ſlender Root, the Patient being alſo of a good Habit. On the contrary, thoſe which are more inacceſſible, ſupported by a large or broad Baſis, and appear hard, or leſs capable of Elongation, ſuch are very difficult to cure or remove, eſpecially when the Patient is afflicted with a ſcorbutic or venereal Diſorder at the ſame time. The removal of them is alſo attended with no ſmall Danger from the Difficulty of ſuppreſſing the profuſe Hæmorrhage, which ariſes after the Extirpation or Evulſion of a *Polypus*, *Prognoſis.*

[a] See CELSUS *Lib.* VI. *Cap.* 8. N° 2.

[b] FABRIC. AB AQUAPENDENTE, *in Oper. Chirurg.* Cap. *De Polypo*, will have all *Polypuſes* to be annexed to the *Os ſpongioſum*, which I have experienced to be falſe.

[c] GARENGEOT writes, that a *Polypus* generally divides itſelf into Branches, which is contrary to Experience; for they are generally ſimple, as I have often ſeen.

eſpecially

eſpecially one that has a broad Root or Baſis: Indeed AQUAPENDENS makes ſlight of this Danger, but unjuſtly; for you ſhould be very cautious of removing ſuch a *Polypus*. If the *Polypus* inclines to be cancerous, that is, when it appears hard, livid, and very painful, as it is not unfrequent, it will be ſafer for you to palliate the Diſorder by a proper Regimen, Diet, and internal Medicines, ſince it is dangerous irritating it, like other Cancers. In like manner when the *Polypus* is inacceſſible with a broad Baſis, or cauſed by a *Spina ventoſa*, as I remember to have ſeen a large one, it will be ſcarce poſſible to prevent the Tumor from growing again in a little time after its Removal, unleſs you firſt cure the *Spina ventoſa*. I know AQUAPENDENS aſſerts, that he never knew a *Polypus* grow up again; but this has been ſeveral times obſerved by myſelf and others; ſee LE DRAN *Obſ.* VI. When the *Polypus* extends itſelf into the Fauces, it proves a great Impediment both to the Speech and Deglutition, and ſometimes to Reſpiration, even ſo as to ſuffocate the Patient, as CELSUS had long ago ſeen, and to be incapable of Extirpation without great Danger and Difficulty. Laſtly, when the *Polypus* fills both Cavities of the Noſe, it is uſually much more difficult to cure, becauſe generally attended with a worſe Diſorder. What has been here obſerved will alſo hold true with regard to *Sarcomata*, eſpecially ſuch as are joined with a *Spina ventoſa* of the *Oſſa Narium*.

Prognoſis. IV. The Cure of a *Polypus* cannot be reaſonably expected from any thing but a total Removal, which may be done two ways, either by cauſtic Remedies, or by proper Inſtruments, by either of which they may be taken off all at once, or by a bit at a time. Cauſtic Medicines may anſwer our Intentions when the Excreſcence is ſmall and ſoft, or ſhort, and with a broad Baſis; but Care muſt be taken at the ſame time to prevent the Cauſtic from corroding the other ſound Parts of the Noſe. The mildeſt Eſcharotics are moſt recommended for this purpoſe, ſuch as *Pulv. Sabinæ, alum. uſt. præcipitat. rubr. vitriol. alb. rad. Hermodact. &c.* to be applied either alone, or mixed with Honey, or ſome digeſtive Ointment, impoſed on the *Polypus* by means of a Tent, when it is ſeated internally; but when it appears externally, you may apply it without. POTERIUS (*Obſ.* 63. *Cent.* III.) recommends a Powder of the Roots of *Scorpioides* or *Heliotropium*, as a very gentle Eſcharotic, to be introduced twice a Day into the Noſe with Cotton for removing a *Polypus*, which it will do very readily, and almoſt without any Pain; but which of the ſeveral Species of this Plant is here intended, we are not informed. RULANDUS (*Cent.* VIII. *Obſ.* 81.) extols a Mercurial Water, with which he aſſerts he has cured a *Polypus* in a few Days time by wetting therewith every Morning and Evening. For this purpoſe are alſo equally efficacious the *Ung. Aegyptiac. & fuſc. Wurtzii, Ol. Tartar. P. D. Eſſent. Sabinæ vel ſolutio Mercurii ſublimati in Spiritu Vini*, with which laſt WEDELIUS writes, that he cured a *Polypus*. The *Aqua phagedænica* is alſo very ſerviceable in this Caſe, according to NUCKE, as alſo *Mercurius præcipitatus*, upon which a Quantity of *Spiritus Vini* has been deflagrated, or a Solution of *Sal Ammoniacum* in Water, or the acid Spirit of that Salt, according to MUSITANUS. If none of theſe take effect, you may have recourſe to the ſtronger Eſcharotics, as the *Lapis infernalis, Merc. ſublimatus, Arcanum corallinum, &c.* But theſe laſt ſhould be mixed with Honey or *Baſilicon* before their Application, that they may not deſtroy the ſound Parts; and if the *Polypus* lies concealed in the Noſe, a ſmall Portion of your eſcharotic Medicine ſhould be conveyed

veyed to it through a Quill or other Tube. Still more powerful in conſuming mild *Polypuſes* are the *Spiritus & Oleum Vitriol. Aq. fort. ac Butyrum Antimonii*, applied through a Tube by a Pencil, Bruſh, or a Feather. You muſt afterwards daily remove ſo much of the Excreſcence as is eroded by the Cauſtic at every Dreſſing, by a Pair of Pliers or Sciſſors. The eminent Surgeon formerly at *Paris*, M. THIBAUT, proceeds in the following method: Firſt, he defends the ſound Parts near and leading to the *Polypus* with two Emplaſters, that they may not be injured by the Cauſtic; and then with a Tent or Pencil-bruſh dipt in *Butyr. Antimon.* he carefully touches the *Polypus*, and at laſt waſhes it off with warm Water, that it may not penetrate too deep into the Parts, by which method M. GARENGEOT aſſerts, that he compleats the whole Operation in three Minutes; but whether he applies the Cauſtic more than once, that Author does not tell us, though I am perſuaded its Application muſt be many times repeated to make an entire Deſtruction of the *Polypus*.

Cure by Inſtruments.

V. But in moſt Caſes the Surgeon will find it ſafer to remove theſe Excreſcences by Inſtruments, rather than by Cauſtics; to do which there are various methods of operating. But before you enter on the Operation, the Patient muſt be firſt prepared by a proper Regimen, Diet, and Medicines, and then he muſt be ſeated againſt the Light, with his Head ſecured, inclining backwards, by an Aſſiſtant; this done, you may now chuſe either of the following Methods of operating, as may appear to be beſt ſuited to the Circumſtances of the Caſe.

I. According to CELSUS.

We ſhall begin firſt with the moſt ancient method propoſed by CELSUS in *Lib.* VII. *Cap.* X. where he teaches, that the *Polypus* is to be removed, and ſeparated from the Bones by a ſharp Inſtrument in Shape of a *Spatha*[a], taking care not to wound the Cartilage below, which would be very difficult to cure. When the Excreſcence is ſeparated you muſt extract it with a Steel Hook, and then you muſt, with Lint folded up, or a Pencil, apply ſome Medicine to ſuppreſs the Hæmorrhage, with which you are gently to fill the Cavity of the Lint. When it is cleanſed you may apply your epulotic Medicine with a Feather, to induce a Cicatrix, in which Method you muſt continue till the Cure is compleated.

II. ÆGINETA.

Not much different from this Method of CELSUS is that propoſed by ÆGINETA, *Lib.* VI. *Cap.* 25. where he directs the Patient to be ſeated againſt the Light, and while the Surgeon dilates or opens the Patient's Noſe with his left Hand, and with his right to paſs a *Spatula* made for the purpoſe in the Shape of a Myrtle-leaf, with which he muſt extirpate the *Polypus* by a circular Inciſion, applying the Edge of the Inſtrument againſt the Adheſion of the *Polypus* to the Noſe, and then to extract the Excreſcence with the Handle of the ſame Inſtrument: To induce a Cicatrix he uſes a Couple of leaden Pipes. That the whole *Polypus* is removed may be known partly from Inſpection, and partly by the Freeneſs of the Voice, and the Liberty of Reſpiration through the Noſe.

III. ALBUCASIS.

The celebrated *Arabian* Phyſician and Surgeon ALBUCASIS directs (*Lib.* II. *Cap.* 4.) to extract the *Polypus* as far out of the Noſe as you can with a Hook or Forceps, and then to remove it by Inciſion as conveniently as may be; in which Method you are to proceed till the whole

[a] A Sort of Inſtrument of which we are ignorant; though it is generally deſcribed to be a kind of double-edged *Scalpel*.

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is extirpated. If you cannot thus totally remove the *Polypus*, its Remains may be deſtroyed by a pretty thick Cord, full of Knots at a Finger's Breadth aſunder, introduced and drawn through the Noſe, and out at the Mouth, and dreſſed with *Ægyptiacum*. But FABRICIUS AB AQUAPENDENTE rejects theſe Methods of the Ancients upon many Accounts, and endeavours to eſtabliſh a Practice of his own[a], as he ſays, for removing theſe Excreſcences by Abſciſſion with a Pair of cutting Forceps[b], which he prefers before any other Method. Theſe Forceps he introduces gently into the Noſe to the Root of the *Polypus*, which he, by this means, cuts clean off, and then extracts it. He juſtly prefers this Practice as ſafer than the preceding Methods; and ſays, that when the whole *Polypus* is not taken off at the firſt time, you may, on the following Days, remove more of it by a little at a time, till it is wholly extirpated. If the Wound bleeds plentifully, which it is not ſo apt to do in this Method, he directs to ſuppreſs it with red Wine and Alum, of which more hereafter. We find that this Method was alſo followed by SENNERTUS and GLANDORPIUS, as well as by AQUAPENDENS, and I have ſeveral times known it to ſucceed myſelf.

IV. AQUAPENDENS.

Other Methods of Cure.

VI. There are yet ſeveral other Methods of removing *Polypuſes*; thoſe which are recent will ſometimes ſhrink and diſappear by repeated Puncturation or Scarification with a *Scalpel* or Lancet, as SEVERINUS aſſerts he has experienced. Some recommend the actual Cautery; but the more Judicious are not forward for uſing it, both on account of the Torture it gives, and of the Danger there is of its injuring the ſound Parts of the Noſe. Some greatly prefer the falciform *Scalpel* of GLANDORPIUS, figured by ANDREAS A CRUCE, as the moſt commodious Inſtrument for extirpating theſe Excreſcences, after you have extended them in a proper manner with a Hook; but this, in my Opinion, cannot often be uſed with any Conveniency. MESUE amputates thoſe which have a ſlender Root, and hang out of the Noſe, with a Pair of Sciſſors; and theſe which deſcend towards the Fauces, he draws forwards with a *Tenaculum*, and cuts them off near the Root with a Pair of red-hot Sciſſors. Others again think the Method of ſeparating theſe Excreſcences by Ligature to be the ſafeſt and beſt; eſpecially as by this means you avoid any profuſe Hæmorrhage. For this Reaſon GLANDORPIUS paſſes a Thread of ſtrong Silk waxed round the Baſis or Root of the *Polypus*, and drawing it as tight as he well can, ſecures it with a Knot, and then cuts off the fleſhy Excreſcence cloſe to the Ligature; but to perform this with more Eaſe and Advantage, it will be neceſſary to extract the *Polypus* as far as you can out of the Noſe, by the Pliers repreſented in *Tab.* XIX. *Fig.* 9 or 10. this, however, muſt be done gently and gradually, leſt you ſhould break off the Tumor before you have made the Ligature, which muſt be left upon the Part after your Abſciſſion, till it is digeſted off ſpontaneouſly; and thus you cure the Diſorder without running the Hazard of a profuſe Hæmorrhage, which is ſometimes ſo large as to kill the Patient, eſpecially when the *Polypus* is removed by Evulſion. Others leave the *Polypus* remaining entire, after having made their Ligature, till it ſeparates of itſelf together with

[a] SEVERINUS aſſerts he is not the Inventor of this Method, and quotes ſeveral others who uſed it before him.

[b] Which are figured in his *Oper. Chirurg.* Tab. III. but are different from the Forceps repreſented by SCULTETUS; but it cannot be perceived how either of them ſhould extirpate a *Polypus*.

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the Thread, as I have ſometimes done myſelf. But you ought to make a freſh Ligature on the ſecond or third Day, if you do not perceive it to wither and decay by the firſt. And in this manner I lately removed a *Polypus* from a noble Lady in the ſpace of four Days, without any Pain or Hæmorrhage.

My method of curing the Diſorder by Ligature.

VII. As the *Polypus* laſt mentioned was removed by a particular Contrivance of my own, I ſhall, for the Benefit of young Practitioners, give an Account of the Caſe, and of the Method in which I proceeded. A noble Lady above ſeventy Years of Age, in other reſpects well, having been frequently troubled with bleeding at her Noſe, perceived a fleſhy Caruncle ſprouting up in her left Noſtril, ſoon after the Hæmorrhage of her Noſe had been ſtopt by cold Water; this by degrees advanced, till it not only filled up the Noſtril, but even diſtended and deformed her Noſe to a great degree, ſo that ſhe could at laſt ſcarce draw any Air through that Organ. She had conſulted ſeveral neighbouring Surgeons and Phyſicians, who, perceiving the *Polypus* to appear externally, had treated it for a conſiderable time with Eſcharotics, but to no purpoſe; for as faſt as they conſumed it one Day by this means, the Tumor grew up as much again the next; and therefore ſhe came for my Advice and Aſſiſtance to *Helmſtadt* in *March*, in the Year 1734. Upon examining the Patient I found a *Polypus* of a dark-red Colour, about the Size and Shape of a Damaſcene, or ſmall Prune, appearing partly out of the Noſe, but concealed moſtly within the Noſtril, which it had greatly diſtended. It could not well be drawn out of the Noſe, from the Rigidity and Shortneſs of its Root; but upon ſearching after the Condition of its Root with the Probe, I found it grew neither from above, nor below, but from the middle of the Side of the Noſe. Upon being aſked by the Lady and her Friends, what method I judged moſt convenient to remove it by, I began to think if there might not be a gentle method of removing it by Ligature; ſince Cauſtics had been tryed in vain, and to attempt its Exciſion or Evulſion in a Perſon of her Age, could by no means be expected to ſucceed. I now began to contrive in what manner I ſhould convey my Ligature round the Baſis of the *Polypus*, which, being here ſeated far within the Noſe, and cloſely filling up its Cavity, made this part of the Operation no ſmall Difficulty; and therefore while the Patient was preparing, I invented and procured the Inſtrument repreſented in *Tab.* XIX. *Fig.* 12. which anſwered my Intention very well. Through the Aperture B in the point of the crooked End of this Inſtrument I tranſmitted a double Thread of ſtrong Silk, and fixing the Patient conveniently againſt the Light, I elevated and opened the *Pinna naſi* with my left Hand, and holding the Inſtrument by the Handle A in my right Hand, I conveyed its End with the Thread carefully betwixt the *Pinna* and *Polypus* upwards, and when the Thread came into View, extracted the ſame out of the Noſe, and then gently depreſſing my Inſtrument, laid it aſide, leaving the Thread behind it round the *Polypus* in the Noſe, and drawing the Thread tight, I then tied it with a double Knot. The next Day I repeated the ſame Operation, and afterwards I made a Ligature round the Root a third time in the ſame manner; by which means the Excreſcence became very hard and black. On the fourth Day the *Polypus* appearing very hard and black, I pulled the String a little, to obſerve whether it was looſened, and to the Admiration of the Patient and Spectators, it brought away the *Polypus* like a Plumb or Damaſcene, without cauſing any

Pain or Hæmorrhage. The Patient's Noſe afterwards recovered its natural Figure, and ſhe breathed through her Noſtrils as freely as ever.

When, and how to remove a *Polypus* by Evulſion.

VIII. But it muſt be owned, that this method by Ligature will not ſucceed when the Root of the *Polypus* is ſeated much farther in the Noſe, or when it adheres or grows to any *Sinus* of the *Cranium*. Therefore, to remove theſe *Polypuſes*, whoſe Roots are inacceſſible, you muſt have a pair of Curve *Forceps* according to PIGREUS, called a *Crow's Bill*, like that in *Tab.* XIX. *Fig.* 9. repreſented from PALFYN, or rather that at *Fig.* 10. whoſe Beak is perforated AA to hold the *Polypus* more firmly: With which Inſtrument you are gently to twiſt and extend the Excreſcence till you break its Root, and then extract it. If the *Polypus* hangs down behind the *Uvula* in the *Fauces*, if you cannot take hold of it with the Pliers, and extirpate it with the Sciſſors, in the method before propoſed by MESNE, you have then no other method but gently to twiſt and extract the *Polypus* as we before directed, either with the crooked *Forceps* in *Tab.* XIX. *Fig.* 11. or with the Stone *Forceps*, *Tab.* XXVIII. *Fig.* 6. in performing which you muſt be very careful to avoid pinching or lacerating the *Uvula* at the ſame time; though we are told that M. PETIT cut off the *Velum palati* in two Places, that he might the better extract a very large and dangerous *Polypus*. When you find a *Polypus* extending itſelf both into the Noſe and *Fauces* at the ſame time, you are to remove the anterior Part of it firſt; ſee LE DRAN, *Obſ.* VII.

How to ſuppreſs the Hæmorrhage.

IX. If the Flux of Blood is but gentle after removing the *Polypus*, the Surgeon may permit it to continue till it ceaſes of its own accord, or ſuppreſs it by ſnuffing a Solution of Alum in red Wine up the Noſe; but when the Hæmorrhage is profuſe and dangerous, you uſe highly rectified *Sp. Vini*, or ſome of the ſtyptic Liquors and Powders we have propoſed for the bleeding of Wounds, which the Patient muſt draw up his Noſtrils, or you muſt fill his Noſe with Lint dipt therein, and formed into Doſſils, being firſt ſecured by a Thread whereby you may extract them, which laſt method is your chief Refuge in very profuſe Hæmorrhages.

LE DRAN's method of ſtopping the Blood.

X. M. LE DRAN, in *Obſ.* VI. propoſes a new method of reſtraining the Flux of Blood in this Operation, by joining a dozen or fifteen Threads together in the ſame manner as for a Seton, which he conveys through the Noſtril into the *Fauces* by the crooked *Forceps*, *Tab.* XIX. *Fig.* 11. he then extracts the End of the Thread hanging in the *Fauces*, through the Mouth, by a pair of Pliers, and to this End he faſtens two thick Bundles of Lint (*Bourdonets*) the firſt dry, and the other dipt in ſome ſtyptic Liquor; then he draws forward the Thread at the Noſe, which brings the Doſſils up into the *Fauces* and Back-part of the Noſtril, ſo that the firſt Doſſil of dry Lint clears the Blood from the Parts, and drives it forwards into the Noſe, while the other, armed with Styptic, faſtened about a Thumb's Breadth behind the former, exactly cloſes the Aperture of the Noſe into the *Fauces*; and thus the Blood is prevented from running into the Mouth, *Pharynx*, or *Larynx*, ſo as to relieve the Patient of his troubleſome Cough, and other Uneaſineſs it occaſions; and if the anterior part of the Noſe is afterwards filled up with Lint dipt in ſome convenient Styptic or Liquor, upon reaching the broken Veſſels, they will be contracted, and the Hæmorrhage will conſequently ceaſe.

XI. AL-

XI. Albucasis, and others of the Ancients, drew a Cord full of Knots through the Noſe, as we before obſerved, not ſo much to ſtop the Blood, as to remove the Reliques of the *Polypus*; and to ſucceed the better in their Intention, they ſometimes dipt the knotted Cord in *Ung. Ægyptiac.* And though this Practice of the Ancients is rejected as cruel and frightful by Aquapendens and others, yet we find it lately renewed by M. Le Dran, in a Caſe where the Root of the *Polypus* adhering to the Back-part of the Noſe above the Palate, and behind the *Vomer*, could be removed by no other method. He therefore conveyed his Seton Ligature through the Noſe in the manner before deſcribed, but without arming it with Knots, as the Ancients did, and for about twenty Days he continued to dreſs by his Ligature with Digeſtives, and then with Deſiccatives; by which means he cured the Patient within the ſpace of a Month; ſee his *Obſ.* VI. Other methods of Removal.

XII. M. Garengeot, and ſome others, propoſe to lay open the Noſe by Inciſion with a *Scalpel*, in order to extirpate ſuch *Polypuſes* as have their Roots ſeated in ſome otherwiſe inacceſſible Part of this Organ, which is a Practice alſo recommended formerly by Hippocrates and Guido de Cauliaco; after which they cauterize the Root of the Excreſcence; which method was alſo propoſed formerly by Celsus for an *Ozæna*. But for my own Part I ſhould rather diſſuade from this Practice, even in thoſe Caſes in which it might be performed, becauſe of the great Pain, with the unſightly Cicatrix, which attends it; and the rather, becauſe when you have laid open the Noſe, the *Polypus* cannot be very often removed, ſo as not to ſprout up again, as I myſelf have known an Inſtance, and as it is remarked by Hutter of *Norimberg*, in *Obſ.* 50. of his Chirurgical Obſervations. However, when the Surgeon ſhall think it neceſſary to dilate the Cavity of the Noſtrils by Inciſion, it will be proper to make your Inciſion in the *Sulcus* of the Noſe next the Cheek, in order to render the Cicatrix leſs diſfiguring. Apertion of the Noſe by Inciſion.

XIII. In order to heal the Wound, and prevent the Return of the *Polypus*, it will be convenient for the Patient to ſnuff up his Noſe a Mixture of *Sp. Vini cum Mel. Roſar. & Aq. Calc. portiunculâ*, or to inject the ſame by a Syringe, or elſe to fill the Cavity of the Noſe with Lint dipt in it, which Treatment is to be continued for ſeveral Days. But if we can perceive any part of the *Polypus* remaining, it muſt be removed either by the Sciſſors, or elſe taken down with *Ung. Ægypt.* mixt with the preceding Injection, and, in ſome Caſes, you may touch it now and then with *Lap. infern.* where that may be done with Safety, filling the Cavity of the Noſe with Lint, ſo as to compreſs the circumjacent Parts, and prevent the ſprouting up of a new *Polypus*. In the mean time the Patient ſhould be kept under a proper Regimen in Diet, and ſupplied with convenient internal Medicines to correct the State of his Juices; particularly Bleeding, Purging, Mecurials, and a Decoction of the Woods ought not to be neglected. Cure of the Wound.

XIV. When the *Polypus* inclines to be cancerous, it will neither be convenient to irritate it with Inſtruments or Medicines, but it ſhould be rather palliated and prevented from inducing worſe Conſequences, by ordering a proper Diet, and Courſe of internal Medicines, as we propoſed in Part I. Book IV. Chap. XVI. N° VI. and Chap. XVII. N° XI. Laſtly, when a *Sarcoma* is found in the Cavity of the Noſe, it is to be treated in the manner we have here di- Cancerous *Polypi* and *Sarcomata*.

rected for a *Polypus*, taking in the Aſſiſtance of internal Medicines at the ſame time. But if all theſe means prove ineffectual, the Diſorder is to be relinquiſhed as incurable, eſpecially when it proceeds from an obſtinate *Spina ventoſa*. You will meet with various Obſervations from Authors on this Diſorder collected by GLANDORPIUS, in his Treatiſe on the Subject, with two conſiderable Obſervations in LE DRAN, *Obſ.* VI. and VII.

CHAP. LXXII.

Of an Ozæna.

An Ozæna deſcribed. I. THE internal Surface of the Noſe is ſometimes ulcerated, and diſcharges a corrupt Matter with bits of *carious* Bones, and a very fetid Smell, which Diſorder is uſually denominated an *Ozæna*, or foul and malignant Ulcer of the Noſe, which is eaſily diſtinguiſhable by its *Fætor* from thoſe ſlight Ulcerations of this Part, which proceed from a Defluxion of Humours, or the Inclemency of the Air, and are eaſily cured with a little *Ung. Ceruſ.* An *Ozæna* is uſually the moſt obſtinate and malignant when accompanied with a *Caries* in the Bones of the Noſe; for though in the Beginning of the Diſorder the Ulceration affects only the internal Membranes, yet by degrees it extends itſelf into the ſlender Bones of the Noſe, and frequently into the *Sinuſes* of the *Cranium* and *Oſſa maxillaria*, producing an incorrigible *Caries*.

Cauſes of the Diſorder. II. An *Ozæna* generally proceeds from an inveterate Catarrh, or ſome other Diſorder in the Noſe, eſpecially when the Patient's Blood is at the ſame time affected with the Scurvy, or venereal Diſeaſe; but it may ſometimes proceed from acrimonious or cauſtic Subſtances drawn into the Noſe together with the Air; ſometimes it alſo proceeds from, or is joined with a *Polypus* in this Part.

Diagnoſis and Prognoſis. III. The Signs of an *Ozæna*, by which it may be diſcovered, are chiefly thoſe at N° I. preceding; but, for the Event of it, it is to be obſerved as one of thoſe Diſorders which admit of a Cure with great Difficulty, becauſe the Bones of the Noſe, eſpecially the *Oſſa ſpongioſa*, in which it is ſeated, are not only of a ſlight Texture, but are alſo not within the Sight or Reach of the Surgeon's Inſtruments, to be thereby properly dreſſed and cleanſed, upon which account the Diſorder the ſooner ſpreads itſelf, and at length deſtroys not only the *Septum*, and other thin Bones within the Noſe, but alſo at length eats away the Cartilages, or external Noſe, ſo as greatly to disfigure the Patient, and corrupt his Reſpiration and Speech.

Cure by Internals. IV. To cure this Diſorder, you ought therefore to have immediate Recourſe to Medicines both external and internal, eſpecially the laſt, which ſhould be ſuch as correct the Blood, and rectify a depraved Habit of Body, often termed *Antivenereals*, of which Mercurials, and a Decoction of the Woods, are the chief. The Patient's Diet ſhould in the mean time be ſpare and light, without ſeaſoning, and, when the Caſe is venereal, nothing proves ſo effectual as a Salivation.

V. Ex-

V. Externally you muſt apply ſuch Topicals as are uſually preſcribed to deterge Ulcers, chiefly ſuch as the *Aq. virid.* HARTMANNI ſnuffed or injected every Day up the Noſe, or applied with Tents or Linen-rags rolled up. I have ſometimes uſed a Mixture of *Aq. Calc. cum Merc. dulc.* with good Succeſs. MAYERN and FALLOPIUS extol mild *Aq. aluminoſa*; you will alſo find great Benefit, in the worſt kind of the Diſorder, from a Decoction of *Savin* and *Scordium*, in a Pound of which you are to diſſolve about an Ounce of the *Ung. fuſc. Wurtzii*, or an Injection of *Sp. Vini cum Mel. Roſar. & Ung. Ægyptiac. aut fuſc. Wurtz.* uſed warm; others again extol the Uſe of Tents ſpread with the *Ung. fuſc. Wurtz.* mixed with a little *Vitriol. alb.* to be inſerted into the Noſe, till the Ulcer is cleanſed, and its Stench removed. Laſtly, fumigating the internal Parts of the Noſe with *Cinnabar* caſt upon a hot Iron, or live Coals, will very often conduce greatly to the Cure of an *Ozæna*; in the Uſe of which Medicines you are to continue at leaſt till the Stench and Diſcharge of corrupt Matter ceaſe. Cure by Externals.

VI. When the *Ozæna* is accompanied with a *Caries*, the Diſorder is hardly curable before you have obtained a Separation of the *carious* Bone, which is the chief Step towards the Cure of this Species of the *Ozæna*. But in what manner we are to extirpate a *carious* Part of the *Oſſa ſpongioſa* in the Noſe, Surgeons have not been yet able to inform us, ſince neither Cautery nor Cauſtic, or any thing ſtronger than the Medicines before preſcribed, can be ſafely uſed in this Organ. In the mean time the Surgeon muſt endeavour to deterge the Parts, and do what he can by the Uſe of thoſe Remedies continued for ſome Weeks or Months, till the *carious* Bone is caſt off; which, when looſe, may be extracted before that time by a pair of Pliers; to prevent the *Caries* from ſpreading into the Parts in Contact. But if the *carious* Bone proves too large to be thus conveniently extracted entire, it may be firſt divided with a pair of Sciſſors, as I have ſometimes done myſelf, after which you muſt perſiſt in the abovementioned Remedies till the corrupt Parts are deterged, and the *Fœtor* removed. Cure of an *Ozæna* with *Caries*.

VII. We meet with a new method of treating a particular Species of the *Ozæna* deſcribed in the Anatomy of Dr. DRAKE, in which the Ulcer is ſeated in the *Antrum Highmorianum*, or *Sinus* of the upper Jaw, diſcovering itſelf chiefly by the diſagreeable Smell and corrupt Matter, which runs out of the Noſe upon inclining the Head on the ſound Side, becauſe in that Poſture the Matter is turned out of the *maxillary Sinus*. But as we are not able by this, or any other means, to clear the Matter from the *Sinus*, this Species of the Diſorder frequently remains incurable, and at length deſtroys the Patient, for whoſe Relief Dr. DRAKE[a] has ſupplied us not only with a true Notion of the Diſorder, but alſo with a new method of curing it as follows: Being aſſured that the *Ozæna* is fixed in the *Antrum*, he orders one of the molar Teeth of the affected Side to be extracted, and then to break through the *Alvearus* or Socket, into the *Sinus* by a Probe, or other ſharp-pointed Inſtrument, like that repreſented in *Tab.* VII. *Fig.* 2. which, he ſays, may be generally performed without much DRAKE's method for the *Ozæna* in *Antro*.

[a] This method of treating an *Ozæna*, with ſeveral other Caſes in DRAKE's *Anatomy*, are ſaid to have been inſerted by the celebrated Anatomiſt and Surgeon Mr. COWPER; but how juſtly, I muſt leave others to determine.

Diffi-

Difficulty, becauſe this Part of the Bone is uſually much decayed or eroded by the retained Matter. Having thus made an Opening into the *Sinus*, you have not only a ready Diſcharge of the offending Matter, but may alſo afterwards deterge and heal the Parts affected, by throwing in proper Injections, compoſed of *Elix. Prop. vel Tinct. Myrrh. & Alo.* either alone, or mixt with a Decoction of *Scordium* or *Savin*, with ſome *Mel. Roſar.* After your Medicine is injected into the *Sinus*, you muſt retain it there ſome time, by immediately ſtopping up the Aperture in the Gums by a Tent; after removing which, and diſcharging the Injection, you muſt inſert another Tent faſtened to a Thread, and intended to keep the Paſſage from cloſing up before the Ulcer is deterged and healed in the *Antrum*. The Succeſs of this Practice is confirmed by repeated Experience; and it is remarkable, that the upper Jaw-Bone is ſometimes ſo much eroded by the confined Matter, that a great Part of it comes away together with the Tooth extracted; ſo that you need not make an Aperture into the *Sinus*, that being, by this means, already performed to your Hand; and you have nothing more to do, than treat the Ulcer with Detergents and Balſamics to compleat the Cure.

CHAP. LXXIII.

Of Artificial Noſes.

WE have already directed in what manner you are to replace and conjoin a Noſe which has been almoſt quite ſeparated from the Face by a Wound, Bite, or any ſharp Inſtrument, in Part I. Book I. Chap. XIII. N° VIII. but we have not yet acquainted you with the method of cutting out a new Noſe from ſome fleſhy Part of the Body, and of conjoining it on the Face inſtead of the true Noſe, which was cut or tore off. TALIACOTIUS has a profeſſed Treatiſe on the Subject, illuſtrated with many Figures, and entitled, *Chirurgia Curtorum per Inſitionem*; yet what is there propoſed by this Author, is, for want of later Experiments and Obſervations, judged to be impracticable, and without Foundation, by our modern Surgeons. When this member is loſt, we muſt ſupply its Defect with an artificial Noſe of Wood or Silver, unleſs, by being on the Spot, you can inſtantly replace and conjoin the real Noſe juſt ſeparated, either by Suture or Emplaſters. Such an artificial Noſe, painted to the Life, and adapted by proper Springs and Screws, may render the Accident and Deformity imperceptible. ROONHUYS, *Obſ. Chirurg.* XXIV. gives an Inſtance of a Noſe ſlit down longitudinally, and cured by Suture. M. BLEGNY in *Zod. Med. Gall.* An. 1680. ſpeaks of a Soldier, whoſe Noſe was cut quite off by a Scymetar, and ſewed on again afterwards ſo well by the Surgeon, that you could ſcarce perceive the Scar: And M. GARENGEOT, in *Tom.* III. of his *Surgery*, Pag. 55. Chap. *On a* Polypus, gives an Account of a Noſe that was conjoined again by Suture, after it was bit off.

CHAP.

CHAP. LXXIV.

Of Opening the Noſtrils preternaturally cloſed.

I. I Do not remember to have ever met with an Inſtance, in Chirurgical Writers, of the Noſtrils being preternaturally cloſed or concreted, and afterwards rectified by Surgery; but that ſuch Caſes do ſometimes happen, and that they are curable by the Hands and Inſtruments, is apparent from the following Account: A poor Infant was brought to me at *Helmſtadt*, *Anno*, 1721, of about three Years old, who, for want of Care and proper Attendance in the Small Pox, a Misfortune to which many poor People are liable, had been grievouſly ulcerated all over its Face, and more particularly in its Noſe and Lips, whereby the Noſtrils were collapſed or cloſed, and concreted ſo ſtrongly to the upper Lip which turned back, that there was no Poſſibility of ſhutting the Mouth, as in *Tab.* XIX. *Fig.* 14. A A. The right Noſtril was totally occluded, and the left ſo contracted and cloſed, that it would not admit the Head of a ſmall Pin; whence the Infant was often troubled with ſuch a difficult Reſpiration in Sleep, that the Parents were afraid every Moment that it would be ſuffocated. Nature of the Diſorder.

II. In this Caſe I proceeded as follows: Having placed its Head againſt the Light, and ordered its Hands and Legs to be held by an Aſſiſtant, I firſt ſeparated the upper Lip from the right Side of the Noſe by the *Scalpel*, and then with a ſmaller *Scalpel* I made an Opening through both the right and left Noſtril, almoſt as large as the natural. I next examined the State of the Parts within the Noſe by the Probe, *Tab.* I. *Fig.* K, and farther enlarged the Openings, and freed the Parts by the *Scalpel*, according as I found neceſſary. After having in this manner opened the Noſtrils, when they had bled a while, I inſerted a pretty thick Tent of Linen into each, which both reſtrained the Hæmorrhage, and kept the Aperture from cloſing at the ſame time. This done, in order to reſtore the upper Lip to its former and natural Poſition, I placed a Doſſil of Lint with a Plaſter, and an oblong narrow Compreſs at the Bottom of the Noſe to depreſs the Lip, and then ſecured the whole Dreſſings by the Sling with four Heads, applied in the ſame manner as for the Hare-lip. This method of Dreſſing was continued for ſeveral Days, only the naſal Tents were uſually dipt in *Sp. Vini*; by which means I reſtored both Lip and Noſtrils to their healthy State within eight Days time. Method of Cure.

III. When the Infant appeared almoſt well, the negligent, but poor Mother, removed the Tents from the Noſtrils, and did not bring it, as uſual, for me to renew the Dreſſings; in conſequence of which the Noſtrils again collapſed and coaleſced, ſo as ſcarcely to admit a ſlender Probe. The Mother now therefore acknowledges her Fault, and implores my Aſſiſtance a ſecond time; whereupon I opened the Noſtrils by the *Scalpel*, as before, and, inſtead of the Tents, introduced two leaden Pipes contrived for this Purpoſe (*Tab.* XIX. *Fig.* 15 *and* 16.) with which both the Noſtrils were kept open, and of their proper Dimenſion, till the Wound was compleatly healed and cicatrized. A ſecond method.

IV. I performed another Cure of this kind upon a little Girl belonging to a Peaſant, in the Year 1725, whoſe Diſorder ariſing in like manner after the Small Other Inſtances.

Small Pox, I treated it in the ſame method. I have ſince had a third Child brought to me at *Helmſtadt*, afflicted with the ſame Accident, in the Cure of which I ſubſtituted Braſs Tubes for thoſe of Lead, which are eaſily compreſſed and deformed. In the Cure of this Diſorder, Care muſt be taken to dilate and keep open the Noſtrils for a conſiderable time, even till after the Wound is cicatrized; otherwiſe, if you remove them too early, the Noſtrils will be ſurpriſingly contracted, though they appeared very large, and ſufficiently dilated before.

An Explanation *of the* Nineteenth Plate.

Fig. 1. Is a Steel Inſtrument, with its Tube, to cauteriſe behind the *Antitragus* of the Ear for the Tooth-ach. A the Tube, B its Handle, C the Cautery appearing through the Tube, D the Handle.

Fig. 2. Repreſents an acouſtic Inſtrument, to help thoſe who are hard of Hearing, made in the Shape of a Horn or Trumpet; the ſmall End A being inſerted into the Ear, the broad End receives, collects, and concentrates the Sound, ſo as greatly to augment the Hearing.

Fig. 3. Is another Inſtrument for the ſame Uſe, having its Tube convoluted.

Fig. 4. Repreſents Dekkerus's acouſtic Inſtrument made of Silver; The turbinated or Shell-part of this is applied to the Ear, round which it is faſtened under the Wig or Hair by the Strings B B, without either being ſeen, or the Trouble of holding it in your Hand.

Fig. 5. Is an Inſtrument to hold the Lobes of the Ears with in boring them.

Fig. 6. Denotes a Needle of Silver or Steel, ſharp-pointed at one End A, and hollow at the other End B, that it may both perforate the Lobe of the Ear, and introduce the leaden Plummit, *Fig.* 7. at the ſame time.

Fig. 7. Is another Needle for the ſame Purpoſe, but ſlit at one End like a larding Needle, that it may introduce the leaden Plummit, *Fig.* 7.

Fig. 8. Repreſents a Pair of arched *Forceps*, from Palfyn, for extracting a *Polypus* of the Noſe.

Fig. 9. A Pair of Pliers for the ſame Uſe, but perforated at their Ends, that they may hold the *Polypus* more firmly.

Fig. 10. Denotes another Pair of Pliers, perforated at their Ends like the former, but made a little crooked, that they may twiſt off and extract *Polypuſes* growing in the *Fauces*, and poſterior Part of the Noſe.

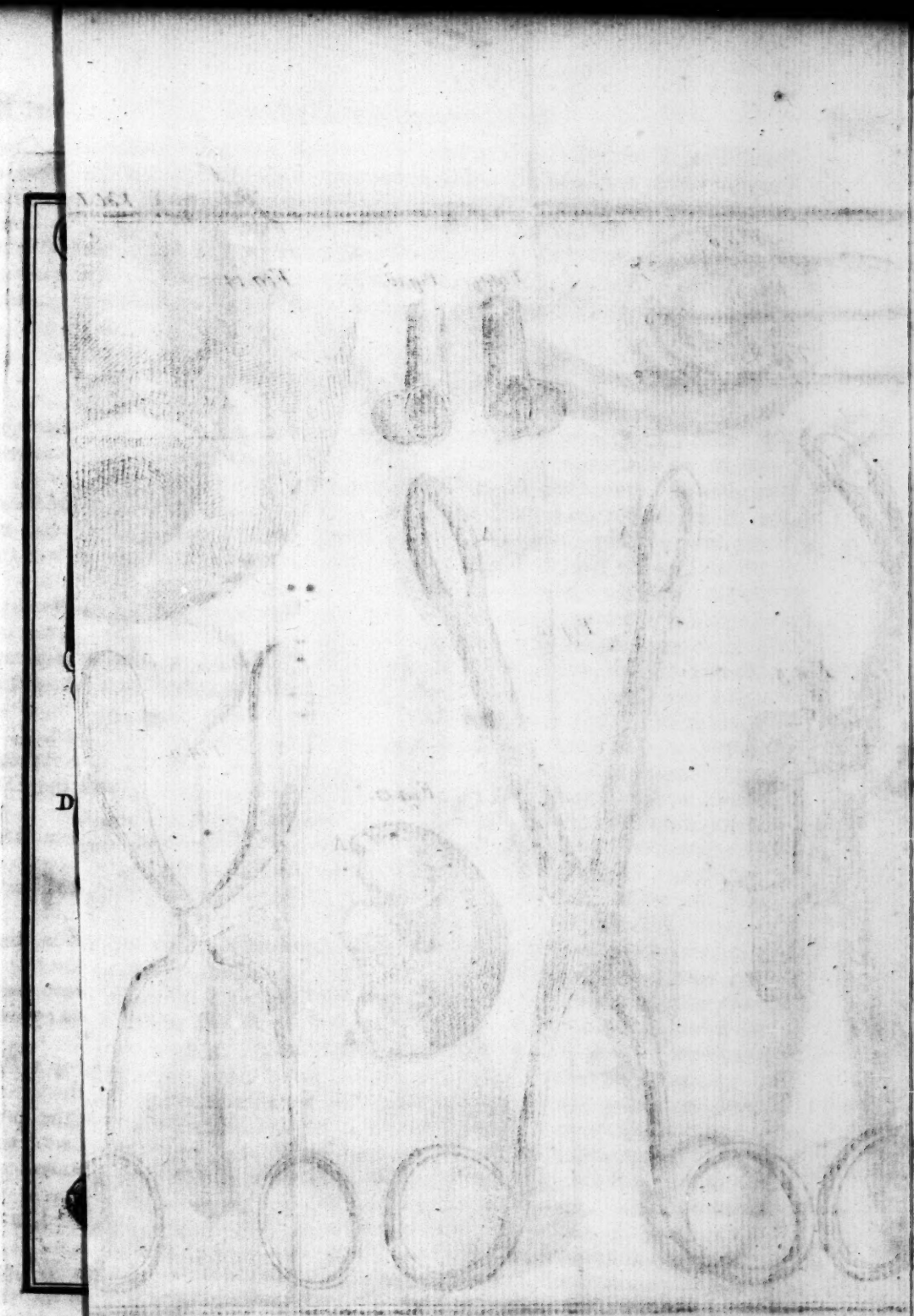
Fig. 11. Is an Inſtrument I contrived to paſs a String round the Root of a *Polypus*, to remove it by Ligature, according to Chap. LXXI. N° VII.

Fig. 12. Repreſents the *Polypus* I removed by a Ligature, made with the preceding Inſtrument, *Fig.* 12. A the Root which grew to the middle of the external Side of the right Noſtril, B the Extremity of it which appeared out at the Noſe.

Fig. 13. Denotes part of the Face, in which the Noſtrils were concreted, and the upper Lip turned back, and joined to the Noſe.

Fig. 14 *and* 15. Repreſent two Pipes of Lead or Braſs, furniſhed with Wings, to dilate and keep open the Noſtrils, *Fig.* 14 for the right, and 15 for the left, in the Cure of the diſordered Face, *Fig.* 13.

Of



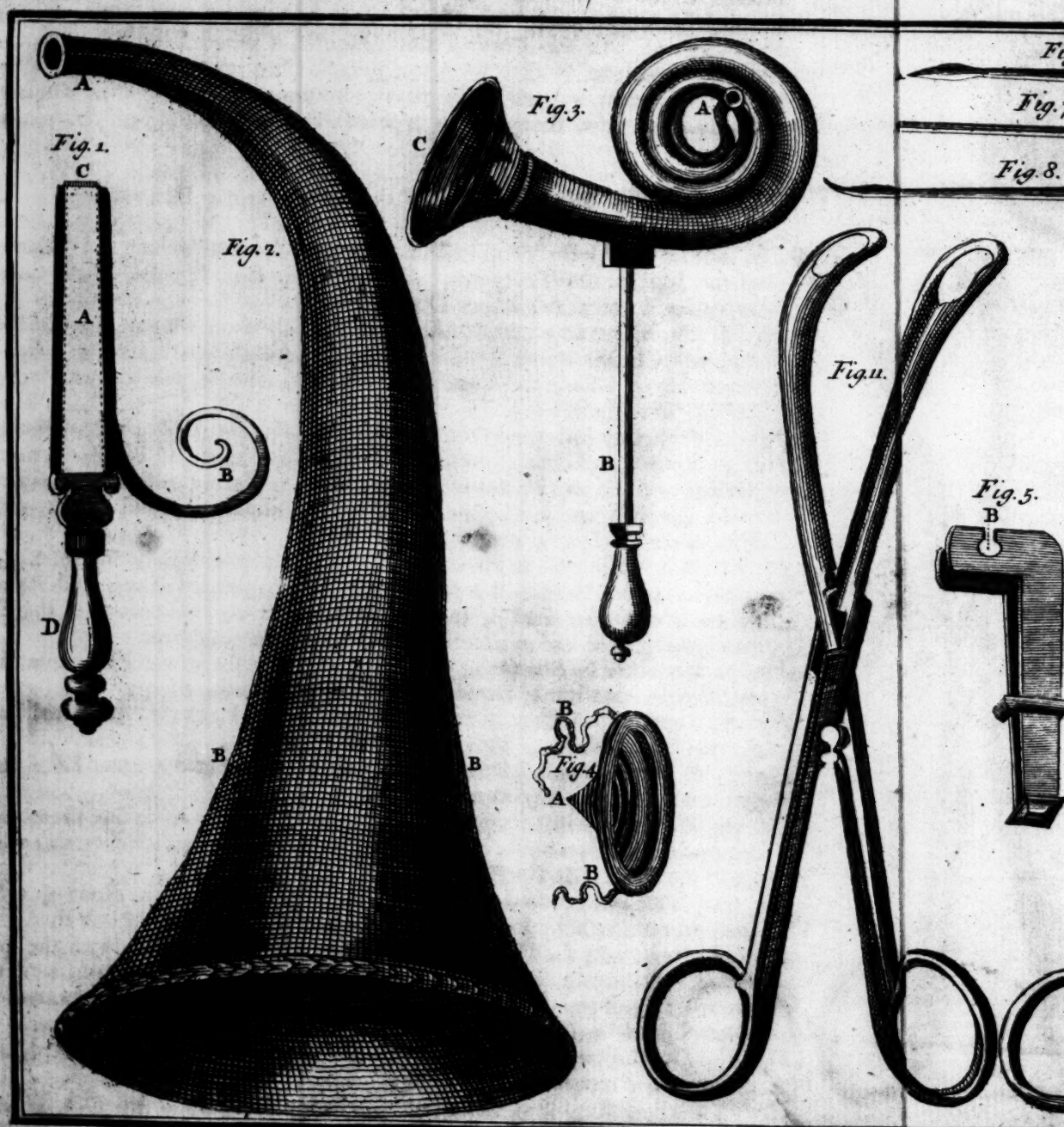

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Fig. 1.
C
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Fig. 8.
Fig. 11.
Fig. 5.
B

Fig. 6.

B

Fig. 7.

Fig. 8.

Fig. 15. Fig. 16.

Fig. 14.

A

A A

Fig. 10.

Fig. 5.

B

A

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Fig. 12.

C

Fig. 9.

Fig. 13.

A

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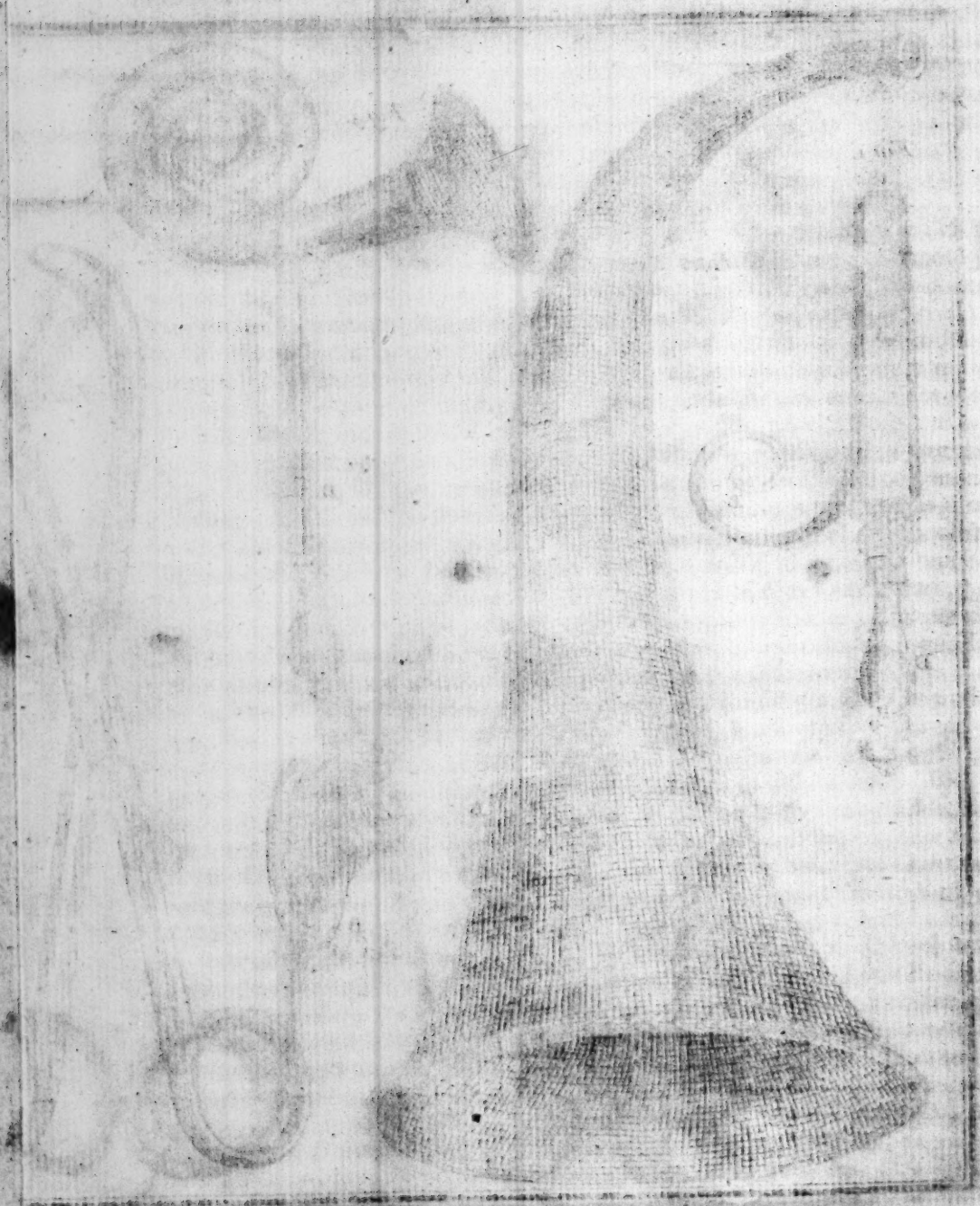

Of Chirurgical Operations on the Lips.

CHAP. LXXV.

Of the Hare-Lip.

I. IN ſome People we obſerve the upper Lip in a manner ſlit or divided [a], ſo as to reſemble the upper Lip of a Hare, as in *Tab.* XX. *Fig.* 1. of which kind I lately obſerved and cured one: This Diſorder is therefore called the *Hare-Lip* from its Similitude to the ſame Part in that Animal. Sometimes the Diviſion is ſo large, that one would imagine part of the Lip to be wanting; and ſometimes again the Fiſſure or Diviſion is double, ſo as to reſemble the Letter M, and then the Patient is ſaid to have a double Hare-Lip. In Infants this Diſorder obſtructs their Sucking, as it does the Speech in Adults. Sometimes a like Fiſſure is obſerved in the lower Lip, from a Wound which has been neglected, or improperly treated; and this laſt Species of the Diſorder is termed the ſpurious Hare-Lip. In the true Kind, which is born with the Infant, the Palate itſelf is often divided either in part, or all along to the Noſe and *Uvula*, which laſt Part I have frequently obſerved to be wanting. Hence, when the external Hare-Lip has been cured, the internal Fiſſure of the Palate remains incurable notwithſtanding which greatly impedes and vitiates the Formation of the Voice and Speech. The leſs and more equal the Fiſſure of the external Hare-Lip is, it is generally ſo much the more eaſy to be cured; and the more difficult as it is larger and more unequal. In ſome Infants the Diviſion of their Lip is ſo large and irregular, that one can have little Hopes of a Cure, which may however be very eaſily performed on the very ſame Lip, when adult; ſo alſo the double Hare-Lip is very difficult to cure, from the Largeneſs of the Fiſſure, and other Circumſtances. Sometimes too we met with a Tooth, or Part of the lower Jaw projecting forward into the Fiſſure, which cannot be cured without they are firſt removed. Deſcription.

II. In a recent Hare-Lip, or one which is made by a Wound, you muſt attempt the Cure by the knotted Suture, as we directed in Wounds; but when part of the Lip is wanting, your Operation muſt be made with Needles, as in the true Hare-Lip. In this Operation therefore we do not attempt to ſupply any Part that is wanting, but only to unite thoſe which are divided, which cannot be performed without ſcarifying, and taking off the Skin from the Edges of the Fiſſure, the Performance of which requires great Circumſpection; and therefore we ſhall briefly and plainly deſcribe the beſt Method of performing this Operation. And firſt in regard to the Seaſon, you ſhould chuſe the temperate one of the Spring or Autumn, but rather the firſt, obſerving that your Patient is not troubled with any other Diſorder at the ſame time; and if The Operation.

[a] In M. GARENGEOT's Figure you cannot perceive any Fiſſure or Diviſion in the Lip, but it appears entire.

he is to remove that Diſorder firſt. In the next Place, your Patient is to be prepared by a proper Diet, and the Uſe of lenient Purges, continued for ſome time before the Operation, which muſt be performed in a light Apartment, and will require the following *Apparatus*, to wit, a Pair of Sciſſors, *Tab.* I. and ſome Needles, *Tab.* IV. *Fig.* 21, 22. or *Tab.* XX. *Fig.* 2, 3, 4, 5. made of Gold, Silver, or Braſs, provided they are triangular, and ſufficiently ſharp at the Point, as at *Fig.* 2. or elſe flat, as at *Fig.* 3, 4, 5. that they may more eaſily enter through the Lips. Steel Needles are leſs convenient, becauſe they ruſt, and cannot be eaſily extracted without cauſing Pain and Laceration. You muſt alſo provide ſome ſtrong Silk, a Veſſel full of warm Water, with a Sponge, ſome Lint, Balſam, and a Fillet; or if part of the Jaw or a Tooth protrudes itſelf, you muſt then add a ſuitable Pair of *Forceps* for their Removal; and laſtly, you muſt not want *Hungary* Water, or ſome other Cordial, to recover or cheer up the Patient; all which being provided in Order, you may then proceed on the Operation as follows. If the Patient be an Adult, he muſt be ſeated againſt the Light, with his Head ſecured by an Aſſiſtant; but if it be an Infant, upon whom this Operation is moſt frequently performed, it muſt be laid upon the Lap of a ſtrong Man, with the Hands and Feet ſecured, each by an Aſſiſtant. When the Fiſſure appears large or deep, ſo that the two Parts of the Lip cannot be eaſily conjoined, it will be neceſſary firſt to divide the *Frenulum* of the upper Lip from the Gums with a Pair of Sciſſors, but without wounding the Gums, or uncovering the Jaw. The Operator now removes the external Skin of the Fiſſure with the Sciſſors, taking it off very cleanly, eſpecially in the upper Part, without which they will not intimately unite. The raw Lips are now cleanſed with a Sponge, and then held cloſe together by an Aſſiſtant, while the Surgeon paſſes through them one, two, or three Needles, according to the Age or Size of the Patient; ſo that they may enter and come out of the Lips at about the Diſtance of a Gooſe-Quill from the Fiſſure; for when they are paſſed through nearer to the Fiſſure, they do not hold ſtrong enough, but will tear out, eſpecially in Infants who are apt to cry. The Needles are to be entered from the right towards the left, beginning with the firſt at the upper Part of the Fiſſure, and inſerting them at about a Straw's breadth from each other; but in paſſing the Needles through the Lips of Adults, which are often very compact, you may ſometimes have Occaſion for a Needle-Caſe, *Tab.* VI. *Fig.* 2, 3. to ſuſtain the Lips of the Wound againſt the Point of the Needle; though this may be generally done by the Fingers, which is my conſtant Practice.

Ligation of the Thread.

III. Having thus entered your Needles, and cleanſed the bleeding Lips with a Sponge, you then take a piece of ſtrong Thread or Silk waxt, and, faſtening it about one End of the Needle, you proceed with it either circularly, or like the Figure ∞, as in *Tab.* IV. *Fig.* 21, 22. *Tab.* XX. *Fig.* 5. by which means the Margins of the Lips are brought cloſe together, and the Thread at laſt ſecured by a Knot. It is now the Practice of ſome to break off the Points of the Needles with a pair of Pliers, that they may not project above the Breadth of a Gooſe-Quill beyond the Ligature, that they may not prick the Lip, and produce Pain and Inflammation; but this is not neceſſary when the Needles are ſhort, or when they are ſecured with a piece of Rag or Sponge;

but

but on the contrary, the Cure generally ſucceeds better in this manner, without being attended with any bad Accidents from the Irritation of the Wound.

IV. Your Dreſſing muſt now be made with ſoft Lint dipt in *Mel Roſar.* and applied, according to the common Method, betwixt the Gums and Lip, to heal the Wound internally; which Practice may be followed well enough in Adults, but not in Infants. The external Part of the Wound is at the ſame time dreſſed with *Balſ. Peruv.* or ſome other vulnerary Unguent, covered with a Lint and a Compreſs, and, if you pleaſe, a ſticking-Plaſter with four Heads, as in *Tab.* II. *Fig. d*; two of which are faſtened upon the left Side of the Lip, and two on the right, the whole being ſecured by a Sling with four Heads, or a ſimple Fillet with two Heads, whoſe Extremities may be faſtened about the Head either by a Knot or Pins. Some Surgeons indeed uſe the uniting Bandage, *Tab.* II. *Fig. f*, to conjoin the Parts of the Hare-Lip, after they have been dreſſed with a Plaſter; but this, I think, will do more harm than good, by preſſing the Needles too forcibly; and as nothing more is required than barely to keep the Dreſſings on the Wound, the firſt-mentioned Bandage will anſwer the Intention very well. GARENGEOT adviſes to bleed the Patient two or three times after the Operation; but no Reaſon being offered for this Practice, I think it may be better omitted, as I have always done, and yet not without Succeſs. Dreſſings.

V. It has been the Opinion of the Ancients, that it is not ſafe to perform the Operation for a Hare-Lip upon Infants, before they are two Years of Age, or even till they are four or five, according to GARENGEOT; the contrary of which is taught by Experience, from whence we are furniſhed with Inſtances of Infants happily cured of a Hare-Lip, when they have not been above five or ſix Months old, if they are well in other Reſpects, and the Operation rightly performed. Beſides, Parents are ſeldom willing to defer the Operation ſo long; and therefore I would adviſe expert Surgeons not to be afraid of performing this Operation too early, eſpecially if the Fiſſure is but ſmall. It is alſo a neceſſary Circumſtance in Infants, to keep them from ſleeping a conſiderable time before the Operation; and afterwards to give them an Anodyne, that they may ſleep the better, and lie ſtill the longer after the Operation without moving their Lips by crying. It ſhould alſo be obſerved, rather to let the Infant lie with its Face downward during the Operation, that the Blood may not run down its Throat, and ſet it a coughing. And though the Hæmorrhage is often pretty plentiful in performing this Operation in young Infants, yet no Danger can be well expected from thence; for it rather prevents Inflammation, and generally ceaſes after applying the Bandage and Dreſſing upon the Lip. Whether Infants are thus curable.

VI. But to leſſen the Hæmorrhage, and proceed more conveniently in this Operation, ſome Surgeons think it neceſſary to be furniſhed with ſome *Tenacula*, to hold the Lip on each Side the Fiſſure, before you remove the Skin by the *Scalpel* or Sciſſors; ſee *Tab.* XX. *Fig.* 6, 7. which though they ſeem adapted to make a neater Wound and *Cicatrix*, yet they are ſcarcely ever uſed. In Infants who have a Fiſſure in the Palate, and in thoſe who are more adult, there is frequently a Protuberance of the upper Jaw, or elſe a large Tooth ſtarts forward through the Fiſſure, and which muſt therefore be either extracted or removed before the Operation. Some uſe *Tenacula*.

What is to be obſerved in renewing the Dreſſings.

VII. The Dreſſings ought not to be removed before the third Day, unleſs it be required by ſome Accident, and then they muſt be taken off cautiouſly, to avoid ſeparating the Parts in Contact, and, if they adhere, they ſhould be firſt moiſtened with warm Wine, and when the Thread appears relaxed, ſo as not to retain the Lips of the Wound cloſe together, a new Thread ſhould be faſtened round the Needles, to conjoin them more cloſely. But when every thing ſucceeds well, the Operator has little more to do than to dreſs with ſome vulnerary Balſam. If the Lips of the Wound appear conjoined three or four Days after the Operation, you may then venture to extract the middle Needle when there are three, or the upper one when there are two only; by which means the Threads will ſeparate freely of themſelves, and the Cure may be compleated by dreſſing every Day with *Mel Roſar.* or ſome vulnerary Balſam, with a ſticking Plaſter and uniting Bandage. Laſtly, to facilitate and promote the Cure, the Patient ought to be dieted upon Broths, Emulſions, Milk, Jellies, and ſuch like Subſtances, which do not require any Maſtication, and to reſtrain from loud Talking. In young Infants moiſten the bottom of the Lip with a Feather dipt in *Mel Roſar. vel Syr. Violar.* which will both heal and excite the Infant to lick that Part, which will promote the Cure.

Method uſed by Mountebanks.

VIII. Many *German* Quacks and Mountebanks frequently retain the Lips of the Wound together by ſtrong Thread paſſed through them inſtead of Needles, after which they tie the Ends of the Thread in the ſame manner as we directed for the knotted Suture in Part I. Book I. Chap. VI. N° III. They obſerve the ſame Order in tying the Threads as other Surgeons do in making the Ligature about the Needles, making no Difference in their other Dreſſings, and the Remainder of the Cure; at laſt they cut the middle Thread on the third or fourth Day, as they do the uppermoſt upon the fifth, and the lowermoſt on the ſixth or ſeventh Day; and thus they frequently ſucceed, and perform good Cures, though in an aukward manner, and by obtuſe and unfit Inſtruments, eſpecially when the Fiſſure is but ſmall, for when it is large this Method will hardly ſucceed.

Cautions and Obſervations.

IX. We ſhall now ſubjoin a few neceſſary Cautions and Obſervations concerning this Diſorder; as, 1. When the Skin in the upper Angle of the Fiſſure is not clean cut out, that Part will not unite, though it may be conſolidated below, ſo that it will form a ſort of an *Hiatus* or *Foramen*; to prevent which it will be proper to leave none of the Skin behind. 2. If by neglecting this Caution a *Foramen* ſhould be left above, when the Parts are healed below, there is no better Method of curing it than by cutting out the *Cicatrix* entirely by a double Inciſion, cloſing the Wound afterwards with a Needle and Ligature, in which manner I cured two young Girls of ſuch an *Hiatus*, which had been left in the Lip after the Cure by the Operation performed by Mountebanks. 3. When the Palate is alſo ſlit, and the Fiſſure of the Lip extends itſelf into the Noſe, as in *Tab.* XX. *Fig.* 1. the fore-mentioned Cautions are ſuperfluous. 4. In the double Hare-Lip the four Sides of the Fiſſure are to be cut off, and then conjoined by long Needles and Ligature. 5. Some direct, with Palfyn and Roonhuys, to looſen the Threads about the Needles on the ſecond or third Day; but as thoſe Threads uſually adhere to each other, and to the Wound or Needles, by means of the Blood or Balſam, they cannot be removed without Pain and Injury to the Patient; and therefore I ſhould adviſe you to omit removing

moving the Threads till they ſeparate of themſelves after extracting the Needles; except ſome Inflammation, or other Accident, ſhould require it. 6. I ſometimes uſe a Sling with two or three Hooks, as in *Tab.* IV. *Fig.* 4. which being fixed round the Head, and upon the Corners of the Lips, they are by this means drawn backward. In the next Place, after the Needles are encompaſſed with the Thread, I then faſten another ſtrong Thread to the Hook on each Side, and paſſing them round the Needles, make an Extenſion towards each Side of the Mouth, by which means the Lips of the Wound are better ſecured than in any other Method. 7. Some direct to ſupport and extend the Lip with one Hand, while you cut off the Skin by the Sciſſors with the other; but as, in this Method, the lower Part of the Lip will be more tenſe than the other, it will be more liable to the Inciſion, ſo as to make the Wound too large and unequal; and therefore I think it better not to touch the Lip with your Fingers, but only to remove the Margin of it by the Sciſſors. 8. M. PETIT has invented a Needle for this Operation almoſt like the larding Needle uſed in Kitchens, *Tab.* XX. *Fig.* 8. by whoſe obtuſe End being ſlit A. and paſſed through the Lips of the Wound, he introduces the *Fibula*, *Fig.* 9. made of Silver with two Heads, which is left in the Wound after the Needle is extracted, and then he ties round the Thread about the *Fibulæ* inſtead of the Needles, to conjoin the bleeding Lips; which Method will indeed anſwer very well; but were I to uſe it, the Silver *Fibulæ* ſhould be made each either with none, or but one Head, as that at *Fig.* 10. that it might be more eaſily extracted, for thoſe Heads muſt cauſe Reſiſtance againſt the Parts; I alſo think his Needles are too large and thick, and ſhould therefore rather approve of thoſe *Tab.* XIX. *Fig.* 8. 9. If an Inflammation or Fever with Convulſions ſhould ſupervene after the Operation, I muſt adviſe you, with M. GARENGEOT, to remove the *Apparatus*. 10. But when a large Part of the Lip, or the Teeth are wanting in Adults, ſo as not to be able to ſupport the *Fibula*, you muſt then fix a Plate of Lead under the Lip. Laſtly, it is ſurpriſing that HILDANUS ſhould have nothing upon the Hare-Lip among all his 600 *Chirurgical Obſervations*, which he has publiſhed.

CHAP. LXXVI.

Of a Cancer in the Mouth and Lips.

Deſcription. I. THERE are two Species of Cancers in the Lips, as in other Parts of the Body, *viz.* latent and ulcerated; by a latent Cancer is meant a hard, painful, and inflammatory Tumor in the Lip. The ulcerated Cancer is when the Tumor degenerates into a ſpreading fetid Ulcer, diſcharging an acrimonious, offenſive Matter, which corrodes not only the Lips, but every Part of the Face it touches. This Species of the Cancer is generally ſeated in the lower Lip, as it is repreſented in *Tab.* XX. *Fig.* 21. *a a a.*

Cauſes. II. This lamentable Diſorder commonly ariſes, like other Cancers, from a peculiar Acrimony in the Blood, and an Obſtruction of the ſpongy Glands in this Part, from whence proceeds a livid and painful Tumor or Wart, which by degrees turns to an open Cancer or malignant Ulcer, which quickly divides the

the Lip as if it were ſlit, as at *Fig.* 11. This Diſorder may alſo frequently ariſe in bad Habits from an accidental Blow, Bite, or Puncture of the Lip, *&c.*

Prognoſis. III. The Uſe of Medicines in this Caſe is generally of little or no Service, and almoſt the only Relief that can be expected and hoped for muſt be had from the Knife, which, if not applied in time, there will be great Danger of the Diſorder ſpreading itſelf into the other Glands of the Neck, Mouth, and *Fauces*, ſo as to ſtrangle the unhappy Patient, as I have ſometimes obſerved. But when the vitiated Parts are timely removed, there may be then ſome Hopes of a Cure, eſpecially if the offending Humours in the Blood are at the ſame time corrected, and carried off by a proper Diet and Medicines, which, being generally extreamly difficult to obtain, is frequently the Cauſe of the Diſorder's returning again ſoon after; however, the Diſorder is more likely to be cured in young than in old Patients; and in thoſe the moſt eaſily curable are ſuch as proceed from external Cauſes, or a vitiated Blood.

Cure when from, 1. a Fiſſure. IV. The Cure of a Cancer in the Lips is to be performed in different Methods, according to the particular Condition of the Diſorder; for, 1. When only a ſmall Chop or Fiſſure infeſts the upper Part of the Lip like a painful and inflammatory Ulcuſcle, the Cauſe of the Diſorder being external, from Cold, or the like, it may then be proper to treat it with *Mel Roſar. Bal. Peruv.* or *Ung. Saturnin. ſeu Diapomphol. cum Merc. pauxillo.* and afterwards to cover it with a Plate of Lead that has been rubbed with Mercury, or with a Piece of *Emplaſt. Diapalma* continued and renewed till the Diſorder diſappears. In the mean time a proper Regimen, Diet, and Courſe of Medicines ought not to be neglected. I have by Experience learned, that the Liquor expreſt from rotten Apples, and mixed with *Merc. dulc.* aſſiſted with internal Medicines, afforded great Relief to a certain young Woman troubled with this Diſorder. We alſo read of a Cancer in the Mouth cured by *Vitriol. cærul.* either with or without Olive Oil, *Ephem. nat. curioſ. Cent.* 6. *Obſ.* 43. But when neither theſe nor other Medicines afford any Relief, and we perceive the Diſorder growing daily worſe and worſe, the chief and only Remedy is to extirpate the indurated and cancerous Part of the Lip by two or three Inciſions with a *Scalpel* or Lancet, obſerving rather to remove ſome of the ſound Parts, than to leave the leaſt Bit of the Cancer behind; and then you may conjoin the Lips by two Needles or *Fibulæ*, like as in the Hare-Lip, or when the Fiſſure is but ſmall by the *Sutura nodoſa*; in which Method I ſucceeded in curing the Cancer repreſented in *Tab.* XX. *Fig.* 11.

2. From a Tubercle. V. But when the Cancer of the Mouth is not yet ulcerated, but infeſts that Part of the Lip next the Skin with a very hard and painful Tumor, you are in that Caſe adviſed by ſome Phyſicians to remove it by Eſcharotics, healing up the Wound after the Tumor is deſtroyed; which Practice may indeed ſucceed ſometimes when the Cancer proceeds only from External Cauſes, or an encyſted Tumor; but as the Application of Cauſtics is generally dangerous in theſe Cancers, I ſhould rather adviſe, with the moſt prudent Phyſicians, to extirpate the ſame by the *Scalpel* or Sciſſors. There are two Methods of amputating theſe Cancers, according to their particular Natures; for thoſe which are moveable, you are to make an Inciſion through the Skin with a *Scalpel*, and, after freeing the Tubercle from its Adheſions with the Knife or Sciſſors, the Wound is then to be healed in the uſual manner; but ſuch as are fixt and immoveable

moveable are to be extirpated together with part of the Lip in which they were contained, treating the Wound afterwards by Suture as in the Hare-Lip; but in whatever Method you proceed to cure the Patient, it will be all to no purpoſe, if he does not obſerve a proper Regimen of Diet and Medicines, with Bleeding and lenient Purges, to prevent a ſpeedy Return of the Diſorder. See SCULTETUS *Obſ.* 33. LE DRAN *Obſ.* IX, X, and XI.

Of Chirurgical Operations in the Teeth.

CHAP. LXXVII.

Of Opening the Teeth and Jaws which are clinched.

I. IN ſome People the Jaws and Teeth are ſo cloſely and ſtrongly ſhut, that they cannot be ſufficiently ſeparated either to ſpeak or eat; generally ariſing from a Spaſm or Cramp of the elevating Muſcles of the lower Jaw; whence it is alſo denominated a *Rigor* or *Spaſm* of the Jaw. The Cauſe of this Spaſm is not always the ſame, ſince it ariſes ſometimes from a Wound or Injury of the Nerves or Tendons in different Parts of the Body, or after the Amputation of an Arm or Leg, as I have frequently obſerved in Camps; but ſometimes again it may proceed from an Inflammation of the Muſcles and Parts of the *Fauces* and Jaw itſelf. Cauſes.

II. When the Diſorder proceeds from a Wound, you ſhould examine whether there are any foreign Bodies concealed therein, ſo as to excite theſe and other Spaſms; upon removing which Bodies the Spaſms ceaſe immediately, though you could procure no Relief before by the beſt nervous Medicines. If no foreign Body lies concealed in the Wound, you may then reaſonably conclude the Spaſms to ariſe from an Injury of the Nerves or Tendons, as is ſufficiently apparent from what we have ſaid before of Wounds in the Nerves and Tendons in Part I. Chap. II. N° II and III. and therefore you muſt have Recourſe to the Remedies we have there preſcribed, and, if they do not ſucceed, you muſt totally divide the wounded Nerve, if its Conſequence will not be fatal; after which you will preſently find theſe Spaſms and Convulſions diſappear. Sometimes the injured Nerve is inacceſſible, or cannot be divided without imminent Danger to the Patient's Life, which is a deplorable Caſe; but even here the Patient muſt either part with the Limb, if poſſible, or elſe continue in his convulſive Spaſms. Thoſe who are troubled with this Diſorder after the Amputation of an Arm or Leg, may indeed be much more eaſily cured of it; for in this Caſe the Spaſm will generally diſappear immediately without other Remedies, upon removing the Ligatures on the Veſſels, or the Vitriol, or other Cauſtic, applied to reſtrain the Hæmorrhage. Some again cannot be relieved of their Spaſms by any Means whatever, ſo that the Patient is inevitably obliged to periſh by them, as I have frequently obſerved. When an Inflammation of the Tonſils or Muſcles of the Jaw excite this Spaſm and clinching of the Teeth, you ought to treat Cure.

the

the Patient only with regard to his Inflammation, as in other febrile Diſorders; for this being removed as the Cauſe, the Spaſms will quickly diſappear as the Effects. But that the Patient may not be ſtarved for want of Aliment during his Diſorder, when it holds a conſiderable time, he muſt be plentifully ſupplied with warm Broth, Egg-cordial made with Ale, Almond Milk, Jellies, and ſuch other fluid Nouriſhment, as may be eaſily drawn in betwixt his Teeth, though ſhut; and, when you find it neceſſary, nouriſhing Clyſters may be alſo adminiſtered, compoſed of the ſame Subſtances.

Inſtruments. III. We are furniſhed with ſeveral Inſtruments for opening the Jaws, and ſeparating the Teeth in this Diſorder, termed by ſome *Specula Oris*, as in *Tab.* XX. *Fig.* 12. by which the Mouth may be opened, in order to ſupply the Patient with Food and Medicines; but, in my Opinion, every prudent Surgeon will reject theſe Inſtruments as pernicious; for by the violent Diſtenſion of the convulſed Muſcles in opening the Mouth by this Inſtrument, the Pain, Inflammation, and Spaſms are much more encreaſed, ſo that it will be better to ſupply the Patient with Suppings and fluid Aliments, which he may draw through his Teeth, as mentioned at N° II. My Opinion therefore is, that you ought not only to reject this Inſtrument, but alſo the Method propoſed by M. Dionis, who adviſes in this Caſe to break out a Tooth to ſupply the Patient with Broths and Medicines, when his Mouth cannot be ſufficiently opened by the Inſtrument. Yet I am far from condemning the Uſe of this Inſtrument for inſpecting the Mouth, in examining ſeveral Diſorders of its Parts, or in performing any Operation in the Palate, Tonſils, or Teeth; for in theſe Caſes I much approve of the *Speculum Oris*, *Tab.* XX. *Fig.* 13. or ſome ſuch other Inſtrument.

CHAP. LXXVIII.

Of cleanſing black and foul Teeth.

Cure. I. AS the Teeth are frequently infeſted with a yellow, livid, or black Cruſt, it gives not only great Deformity to the Patient, but alſo infects his Breath, and looſens or decays the Teeth. We ſhall therefore here deſcribe the Methods of ſcouring the Teeth, and diſcharging their morbid Cruſt. For this purpoſe we are furniſhed with various Inſtruments, which may be properly called *Scalpra dentalia*, *Tab.* XII. *Fig.* 14, 15, 16, 17. ſome of which are furniſhed with narrow Points, others with broader, and with Edges, and ſome again are falciform, as that at *Fig.* 17. but all of them are adapted to one and the ſame Handle, *Fig.* 14. *lit.* B. or if you pleaſe, you may have them fixed, each in a diſtinct Handle, like that at *Fig.* 16 and 17. taken from Fauchard's *Chirurgien Dentiſte*. Theſe Inſtruments being applied to the Teeth near the Gums, ſerve to ſcrape off the foul Cruſt from their out-ſide, while you ſupport them within by the Fingers of your left Hand, taking care not to wound the Gums, or looſen and diſplace the Teeth. In this Caſe it will be alſo ſerviceable to rub the Teeth and Gums well with the *Tinct. Gummi Laccæ cum Mel. Roſar. & Sp. Salis, aut Vitriol. Gut.* which will not only whiten the Teeth, but alſo render the Gums more firm. I remember to have ſeen an Operator for the Teeth

Teeth, in *Saxony*, who, though he was furniſhed with various Inſtruments, did not uſe any of them in my Preſence upon ſeveral Patients, but that at *Fig.* 17.

II. But to prevent the black and morbid Cruſt from ſpreading over the Teeth again, it will be neceſſary to ſupply the Patient with a mild Dentifrice, with which he may frequently rub his Teeth every ſix or ſeven Days, and render them white and ſplendid; but the too frequent rubbing of the Teeth with ſtrong and acrid Dentifrices, does the Teeth as much or more Harm than neglecting them. The common Dentifrices for this Purpoſe are compoſed of Powder *ex pumicibus, lateribus, Coralliis, Tabaccáque cineribus, &c.* But theſe by their Roughneſs wear away the Teeth, and the acrid Spirits, as thoſe of Vitriol and common Salt, diſſolve and eat them away by degrees, and therefore it will be ſafeſt to uſe Dentifrices compoſed of ſofter Subſtances, as the *Ocul. Cancror. Mater perlar. Corn. Cervi, Cret. pp. cum rad. Florent.* or *Myrrh. &c.* When the Gums are looſe and flaccid, you may add a few Drops of *Sp. Salis* or *Vitriol.* or the following Mixture: Prevention.

℞ *Cretæ præparatæ,*
Myrrh. rubr.
Rad. grid. Flor.
C. C. præparat. a ʒj *vel* ij.
Sp. Sal. Gt iij. *ad* vj. *m. f. Pulv. tenuiſſimus.*

Or thus, ℞ *Conchar. præparatar. a* ʒij.
Sang. Dracon. ʒj.
Terr. Japon. ℈j. *m. f. Pulv. ſubtiliſſimus.*

Which Powders may be perfumed with a Drop of *Ol. Cinnamom. Caryophyl. aut Rhod. Lig.* The Aſhes of Tobacco are very efficacious in cleaning black Teeth, if they are not uſed too often, ſo is alſo the following Mixture:

℞ *Aq. Plantagin.* ʒj.
Mel. Roſar. ʒij.
Sp. Salis Gt X. *m.*

In theſe may be dipt a bit of Linen to rub the Teeth with every Day till they are whitened, but ſo as to have ſome other Dentifrice to be uſed every ſixth or ſeventh Day in its ſtead; otherwiſe you will corrode and deſtroy the Teeth by too frequent Uſe of Acids, eſpecially the *Sp. Sal.* and *Vitrioli*, which is the common and pernicious Practice of Quacks; and therefore if you are afraid of injuring the Teeth with theſe, you may frequently waſh them off with cold Water after the Uſe of them. And, laſtly, one of the beſt Preſervatives for the Teeth is to waſh them with cold Water, and rub them with the Fingers, not only every Morning, but alſo in the Day-time, and in the Evening, adding ſometimes a little common Salt, which will both preſerve them clean and white, and prevent them from aching and decaying.

CHAP. LXXIX.

Of Hollow and Decayed Teeth.

THOSE Teeth which are hollow and decayed are uſually *carious*, and admit ſome Parts of the Food into their Cavities, which by degrees putrify, become acrimonious, and not only further deſtroy the Teeth themſelves, but alſo irritate the internal *Perioſteum*, and ſmall Nerves of this Bone, ſo as to excite intolerable Pain; to prevent which various methods have been contrived. The firſt is to cleanſe the Cavity of the Tooth with a Needle, Tooth-pick, or ſome other convenient Inſtrument, *Tab.* XX. *Fig.* 19, 20, 21. and then to fill up the Space with white Wax or Maſtich, as often as you ſhall ſee Occaſion; by which means the Teeth will be preſerved from Foulneſs and farther Decay. When the *Caries* is but ſuperficial, it may be frequently removed by the Raſp; but when the Diſorder is in the larger grinding Teeth, eſpecially in their middle, it will be beſt to fill them as exactly as poſſible with a bit of Lead or Gold, by means of the Inſtrument, *Tab.* XX. *Fig.* 20, 21. But when the *Caries* has reached the Root of the Tooth, ſo as to excite intenſe Pain, the Patient may be relieved by filling the Tooth with *Ol. Caryoph. Cinnam. vel Lign. Guiac. &c.* and if theſe do not prove ſtrong enough, it may be convenient to cauterize the Tooth with a red-hot Inſtrument for this Purpoſe inſerted into its Cavity, *Tab.* III. *Fig.* 14, 16. or *Tab.* XX. *Fig.* 20, 21. by which Practice you will free the Patient inſtantly of his Pain, without giving him any great additional Torture, provided you do not burn any of the adjacent Parts of the Mouth. Thoſe Teeth which are thus cauterized, being never afterwards troubled with Pain, ſhould have their Cavities filled with Lead or Gold as before; and if this laſt method proves ineffectual, or if the Cavity cannot be filled with Wax, and Lead or Gold, there then remains but one Remedy, which is, to extract the Tooth, and replace it again, as we ſhall preſently teach.

CHAP. LXXX.

Of the Chirurgical Methods for eaſing the Tooth-ach.

SOMETIMES the Tooth-ach is ſo obſtinate and intenſe, as to yield to no Remedy; and therefore the Patient muſt have recourſe to the Surgeon's Aſſiſtance, who may relieve him ſometimes, 1. by ſcarifying the Gums, as PLINY has long ago obſerved, and which has been confirmed by frequent Experience; or, 2. by inſerting an actual Cautery, or hot Iron into the Cavity of the Tooth, in the manner directed in the preceding Chapter; or, 3. you muſt ſcarify or cauterize behind the Ear, under that part which Anatomiſts call *Antitragus*, or, according to SCHELHAMMER, you muſt ſtrongly preſs the Part with the Fingers; or, laſtly, 4. the decayed and aching Tooth is to be drawn or extracted.

CHAP.

CHAP. LXXXI.

Of rectifying Irregularities of the Teeth, which lacerate the Tongue and Cheeks.

SOMETIMES the Teeth ſtand more out or in than they ought, and ſometimes the ſharp Points of a broken Tooth ſtand out unequally; which Accidents not only impede the Maſtication of the Food, and Formation of the Voice, but frequently lacerate the Tongue, Lips, or Cheeks, from whence very often proceed Inflammations, Tumors, Ulcers, and ſometimes a Cancer; to remedy which Diſorders it will be neceſſary to file away the Inequality by the Inſtrument repreſented *Tab.* XX. *Fig.* 22. or, when that is impracticable, to draw the Tooth.

CHAP. LXXXII.

Of drawing Teeth.

TOOTH-DRAWING, according to CICERO (*De Naturâ Deorum Lib.* 3. *Cap.* 22.) was firſt invented by ÆSCULAPIUS, in whoſe Temple the Ancients hung up a pair of Leaden Pullicans, to ſignify, as I think, that it would be dangerous and improper to extract any Teeth, but ſuch as might be removed with leaden *Forceps*, that is, ſuch as are looſe, and almoſt ready to fall out, for they do not conſult their own Welfare, who imprudently remove their Teeth without abſolute Neceſſity, whilſt they are ſound and entire; for Evulſion of the Teeth is not only a dangerous and painful Operation, but has even ſometimes hazarded the Patient's Life; at leaſt they deform the Speech, and impair the Act of Maſtication by this means, more eſpecially in Adults, in which we can have no Hopes of others growing up in their room; however, it is ſometimes abſolutely neceſſary to draw Teeth, 1. In Infants for removing thoſe deciduous or lacteal Teeth, which, being looſened by the Fingers, may be extracted with a Thread, or a pair of Crow's Bill *Forceps*; for when theſe Teeth are left too long in the Sockets, they may diſplace and turn the new ones a-wry. 2. It will be proper to extract thoſe Teeth in Infants which grow out of the Palate, or ſome other improper Part of the Mouth, which both hinder their Speech and Sucking. 3. Extraction is often the only method of relieving the Tooth-ach, which is very intenſe, proceeding from a *Caries* in the Teeth, and incapable of being eaſed by any Medicines. 4. Thoſe Teeth ought to be drawn, which, by their irregular Figure and Poſition, wound and lacerate the Tongue, Lips, and Cheeks. 5. It is often abſolutely neceſſary to draw a Tooth for curing a *Fiſtula*, or Ulceration of the Gums next the Teeth. The method of drawing them is as follows: If the Tooth to be drawn is fixed in the lower Jaw, the Patient muſt be ſeated on a low Seat, or on the Floor; but when in the upper Jaw, he muſt be ſeated on a high Stool, after which the Surgeon takes his Inſtrument beſt adapted to the Caſe, and thereby draws out the Tooth, as if

extracting a Nail out of a piece of Wood, drawing the upper Teeth downward, and the lower Teeth upward; yet there is a particular Slight to be uſed, to avoid breaking the Teeth, as you may ſee deſcribed more at large in M. FAUCHARD's Book, intituled, *Le Chirurgien Dentiſte*. The Inſtruments uſed for Tooth-drawing are ſo many and various, that almoſt every Operator is furniſhed with a particular one of his own; but thoſe moſt in Uſe are the *Pelicanus*, *Forfex*, and *Crow's Bill*; and leſs common, but more commodious, are the Inſtruments repreſented in *Tab.* XX. *Fig.* 23, 24, *and* 25. though the Uſes of them can be much ſooner ſhewed to the Eye, than deſcribed by Words[a]. There are alſo various Inſtruments for drawing Stumps of Teeth, which cannot be extracted with the *Forfex*, particularly the *Goat's Foot*, and that at *Fig.* 26. That End of *Fig.* 23. marked A, alſo ſerves for this purpoſe. We ſhall conclude this Chapter with obſerving, that though it is often abſolutely neceſſary to remove or extract the Teeth, yet you ought not to perform the Operation while the Patient's Gums, and parts adjacent, remain inflamed and tumified.

CHAP. LXXXIII.

Of Artificial Teeth.

THE great Deformity of the Face, and the Impediment of the Speech, occaſioned by the Loſs of one or more of the Teeth in the anterior Part of the Mouth, has occaſioned the Art of framing other Teeth to ſupply their Places, made of Ivory, Bone, or the Tooth of a Sea-horſe. When ſeveral Teeth are out in the ſame Place, it is beſt to make a Set, or the Number wanted, out of one Piece, all adhering together, which may be faſtened to the two next of the ſound or natural Teeth. But to preſerve theſe artificial Teeth clean and ſound, it is adviſeable to take them out at going to Bed, to wipe them clean, and to inſert them again in the Morning. But if any Stump or Splinter ſhould reſiſt and obſtruct the replacing of the artificial Teeth, it muſt be either extracted, or taken down by the File. See more upon *artificial Teeth* in FAUCHARD.

An EXPLANATION *of the* TWENTIETH PLATE.

Fig. 1. Repreſents the Hare-lip of an Infant two Years old, whoſe Palate was alſo fiſſured, and you may ſee the two *Dentes inciſores* on the left Side.

Fig. 2. Denotes a triangular-pointed Needle for joining the Hare-lip.

Fig. 3 *and* 4. Are two other Needles for the ſame purpoſe, the former with a flat Point, and made of Braſs or Silver, and the latter of the ſame Make and Metal, but without a Head.

Fig. 5. Repreſents two of theſe Needles paſſed through the Hare-lip, with a Ligature circumvoluted or tied round them orbicularly.

[a] More Inſtruments may be ſeen in FAUCHARD's *Chirurgien Dentiſte*. Paris, 8*vo* 1718. and in M. GARENGEOT's *Traité des Inſtrum. Chirurg.* 8*vo* Paris 2d Edit. 1727.

Fig.

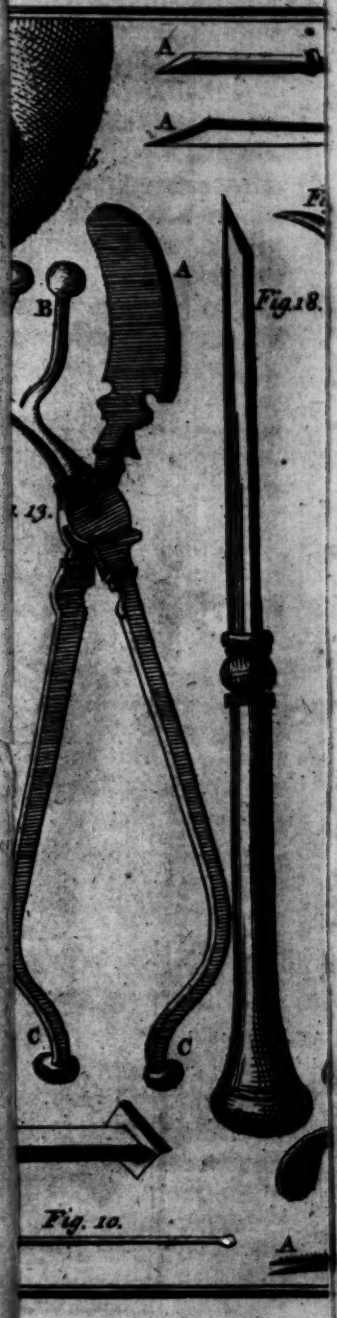

Fig18.

Fig. 10.

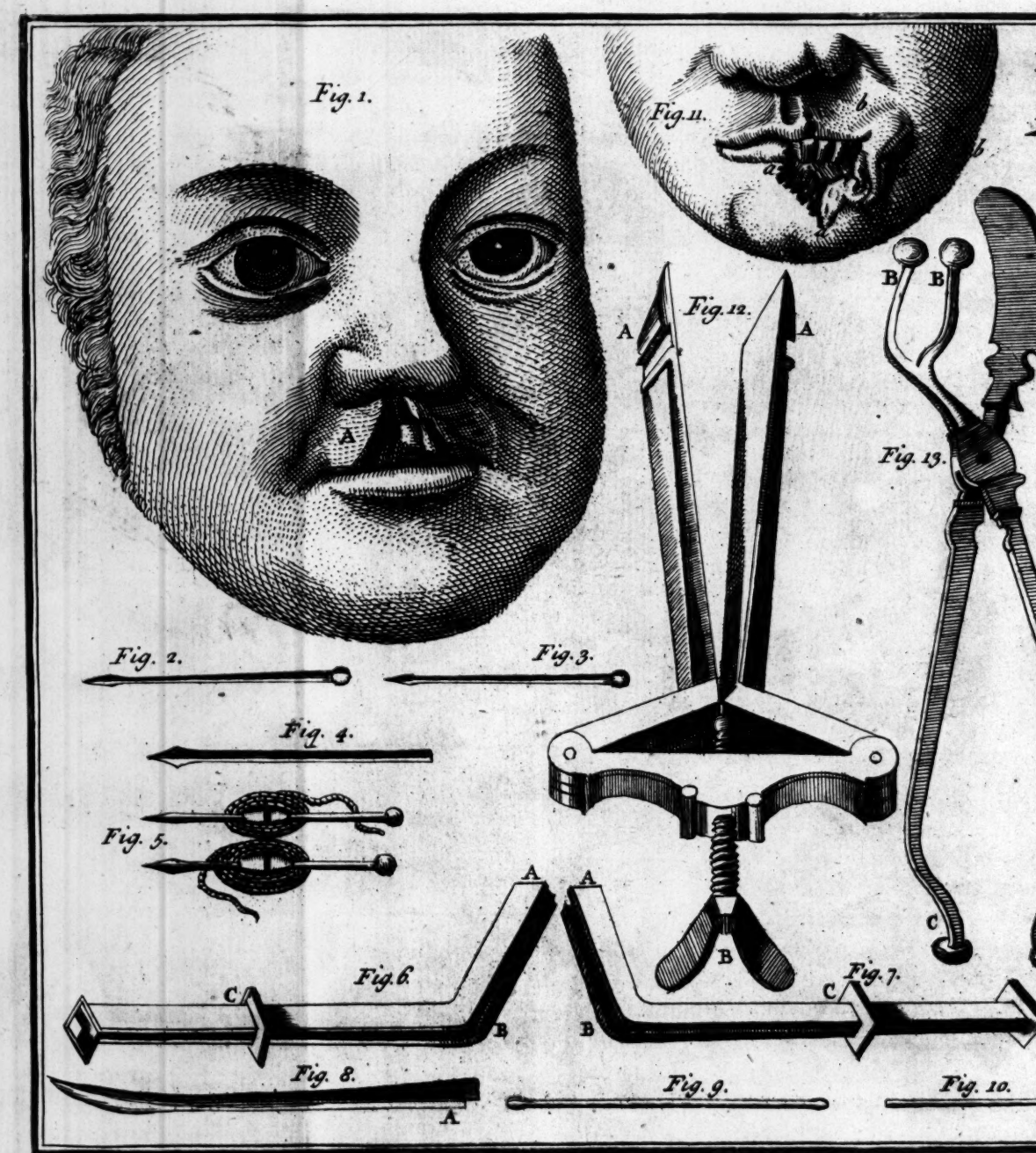
Fig. 1.
A
Fig. 11.
b
a
b
Fig. 12.
A
A
B
B
Fig. 13.
C
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
A
A
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Fig. 6.
B
C
Fig. 7.
Fig. 8.
A
Fig. 9.
Fig. 10.

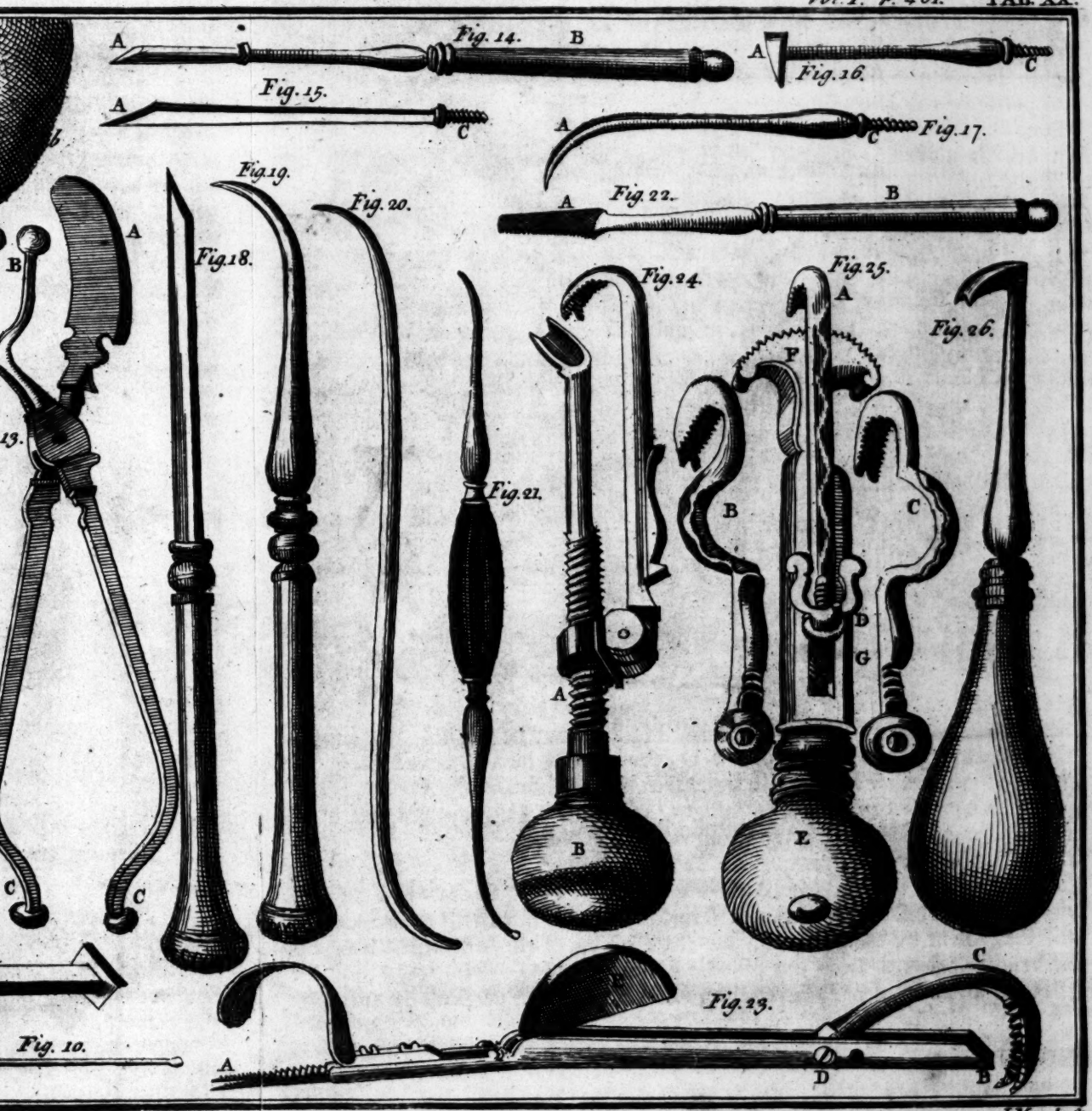
Fig. 14.
Fig. 15.
Fig. 16.
Fig. 17.
Fig. 18.
Fig. 19.
Fig. 20.
Fig. 21.
Fig. 22.
Fig. 23.
Fig. 24.
Fig. 25.
Fig. 26.
Fig. 10.
A
B
C
D
E
F
G

J. Mynde fc.

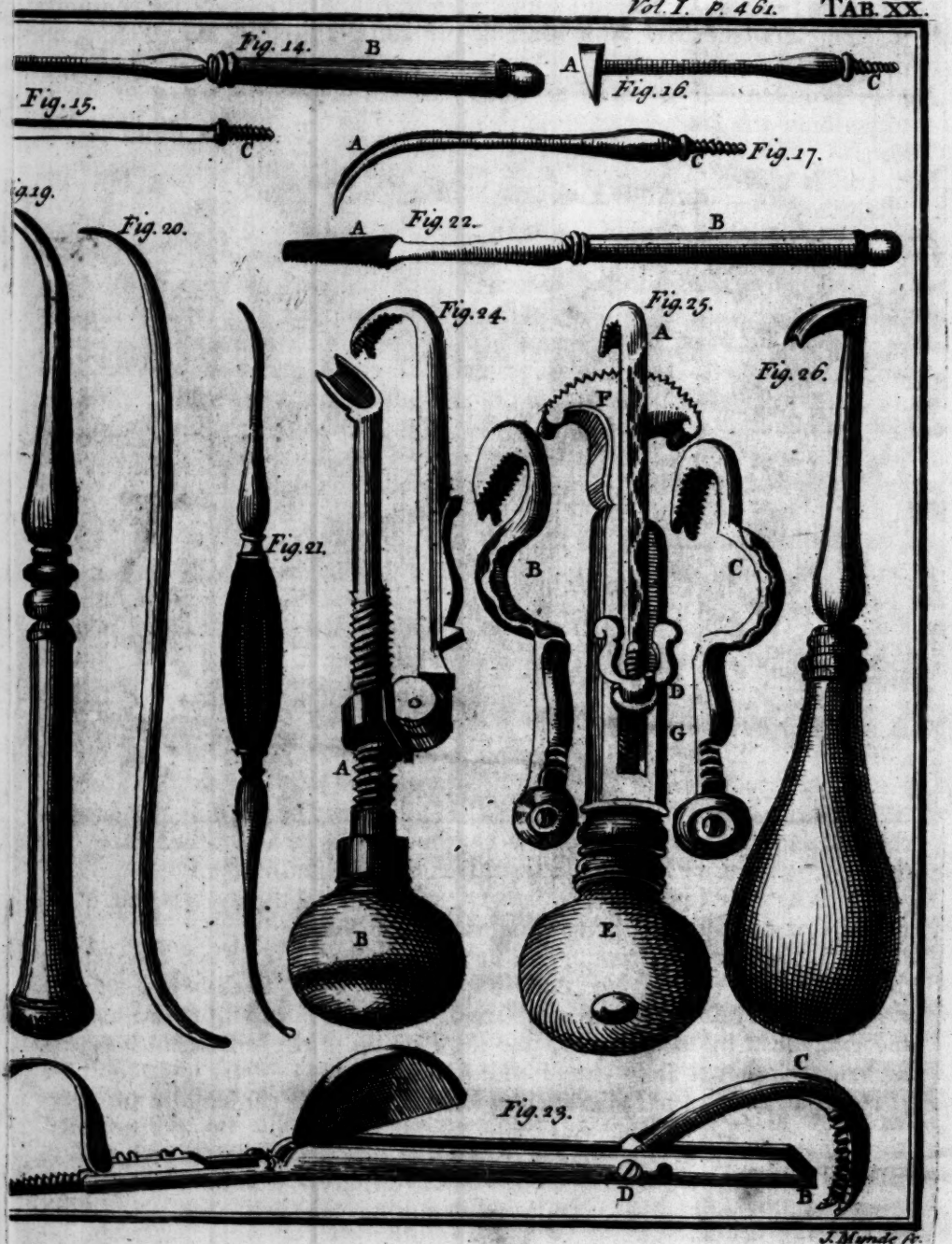
Fig. 14.
B
A
Fig. 16.
C
Fig. 15.
C
A
C
Fig. 17.
g. 19.
Fig. 20.
A
Fig. 22.
B
Fig. 24.
Fig. 25.
A
Fig. 26.
P
B
C
Fig. 21.
D
G
A
B
E
C
Fig. 23.
D
B

J. Mynde fc.

Fig. 6. *and* 7. Repreſent a Couple of *Tenacula* uſed by ſome in the Hare-lip, to ſecure and retain the Margins which they ſcarify, and prevent their profuſe Bleeding. The Parts A B are thoſe which hold the Lip faſt, by thruſting up the Rings C C towards B B.

Fig. 8. Is a Needle in Form of a Larder, contrived by M. PETIT of *Paris*, to perforate the Hare-lip, and introduce the Pins *Fig.* 9. inſerted in its Fiſſure.

Fig. 10. Is a Needle which I prefer before the former, it having but one Head.

Fig. 11. Is a Face with an ulcerated Cancer in the lower Lip *a a a*; *b b b* part of the cancerous Tumor extending itſelf to the left Angle of the Lips.

Fig. 12. Repreſents the *Speculum Oris* furniſhed with a Screw to open the Teeth and Jaws when they are clinched faſt together in Convulſions, *&c.* A A the Parts which are interpoſed betwixt the *Dentes inciſores*, and which are divaricated or opened by the Screw B.

Fig. 13. Is another *Speculum Oris* made almoſt like a pair of *Forceps*; A the Part which depreſſes the Tongue, while the Parts B B elevate the *Dentes inciſores* of the upper Jaw under which they are placed; C C the Handles.

Fig. 14, 15, 16, *and* 17. Repreſent ſeveral Inſtruments to ſcrape and cleanſe the Teeth from tartarous and diſcoloured Cruſt, each of which are adapted by the Screws C C C to the Handle B at *Fig.* 14.

Fig. 18 *and* 19. Are two Inſtruments for the ſame Uſes, but larger, and judged to be the moſt commodious by FAUCHARD.

Fig. 20 *and* 21. Are two Inſtruments for cleanſing and cauteriſing hollow Teeth, and for filling their Cavities with Lead or Gold.

Fig. 22. Is a Raſp or File to take down rough or angular Parts of the Teeth; A the File, B the Handle.

Fig. 23. Is an *Odontagra*, or Inſtrument to draw Teeth. The Part A ſerves to extract Stumps inſtead of the *Goat's-foot*, and the Part B with the Hook C ſerves to extract whole Teeth; for the Hook C may be not only elongated to the Size of the Tooth by the Screw D; but it may be alſo turned back, and repoſited in the Caſe E, ſo as to be conveniently carried in the Pocket.

Fig. 24. Is another convenient *Odontagra*, which may be eaſily adapted either to large or ſmall Teeth, by ſcrewing round the Nut B.

Fig. 25. Is another for drawing the Teeth, furniſhed with three Hooks, one ſtraight A, and two crooked B C, the ſtraight ſerving to draw out the anterior, and the crooked the poſterior Grinders on each ſide the Jaw, faſtened to the Inſtrument by the Screw D, alſo the *Fulcrum* of the Inſtrument F may be ſet longer or ſhorter from the Handle by the Screw G.

Fig. 26. Is an Inſtrument for extracting ſome Teeth, and particularly Stumps.

Of

Of Chirurgical Operations in the Gums.

CHAP. LXXXIV.

Of Lancing the Gums in Dentition.

THE Difficulty which ſome Infants meet with in cutting their Teeth, very often excites not only intenſe Pain and Inflammation in the Gums, but alſo Convulſions and epileptic Fits, which frequently kill the Infant. The Gums in theſe Caſes are uſually too thick and tough to be pervaded without great Difficulty by the young Teeth ſhooting up, which as they gradually advance, violently diſtend the Gums, and excite the fore-mentioned Symptoms; upon the Appearance of which, when you are called to an Infant, you ſhould inſpect the Gums, and make a tranſverſe Inciſion upon the Tooth, where it ſhews itſelf to be riſing by a Redneſs and Tumor of the Gums; after which thoſe malignant Symptoms will generally diſappear [a], and the Wound may be treated with *Mel Roſar.* Dr. SYDENHAM aſſerts, that the difficult Dentition of Infants, though unattended with any inflammatory Diſorder, can by no means be better relieved than by *Phlebotomy*; and, in Adults, VESALIUS [b] obſerves, that the Pain and Inflammation which often ariſes at cutting the *Dentes ſapientiæ*, at near twenty Years of Age, is preſently relieved by inciſing or ſcarifying the Gums affected, as I was obliged to do for myſelf when about twenty-ſix Years old. We have alſo an Obſervation in AMB. PAREY's Surgery (*Book* 24. *Cap. ult.*) of a Son eight Months old belonging to the Duke of *Navarre*, who was loſt for want of having his Gums lanced in difficult Dentition.

CHAP. LXXXV.

Of Epulides *or Excreſcences of the Gums.*

THE fleſhy Tubercles or Excreſcences of the Gums, termed *Epulides*, are of two kinds; ſome being of a mild Nature, and without Pain, others malignant and inclining to be cancerous. They are again diſtinguiſhable from their Size and Appearance, into large and ſmall, hard and ſoft, and ſupported either by a broad or ſlender Root. Theſe Excreſcences not only deform the Mouth, but are alſo an Impediment to the Speech, and to Maſtication, and do therefore require a ſpeedy Extirpation, which is the beſt method of relieving the Patient. When this kind of Excreſcences in the Gums is ſuſtained by a ſmall Root, the beſt method of Extirpation is by a Ligature, about the

[a] As hath been obſerved by PAREY *Lib.* XXIII. Cap. 67. SYDENHAM *in Opuſc.* and DRAKE *Anat.* Book IV. Chap. III.

[b] *De Humani Corporis Fabricâ*, Lib. I. Cap. XI.

Root,

Root, with a Thread [a]; but when the Root is broad, it will be more convenient to extirpate the Excreſcence by mild Eſcharotics or Cauſtics, particularly *Ol. Tartar. p. d. vel Sp. Salis Ammoniaci*; and when the milder ſort of this Tribe prove ineffectual, it will be ſafeſt to extend them with a Hook, or the Pliers, while you extirpate them with the *Scalpel*, yet ſo as to avoid ſeparating the Gum itſelf from the maxillary Bone, which might produce a *Caries*. The Blood may be permitted to flow for ſome time; but if it proves too profuſe and laſting, an aſtringent Gargariſm muſt be uſed, of red Wine or Oxycrate, with Alum, with which the Patient muſt frequently waſh his Mouth, till the Hæmorrhage ceaſes. When the Blood is ſtopped, the Parts affected may be treated every day with *Tinctura Myrrhæ cum Melle Roſarum*, the Uſe of which ſhould be continued till they are healed. If any Part of the Tubercle ſhould remain behind, or ſprout up again, it ſhould be taken down in time by the before-mentioned mild Eſcharotics, or with a bit of *Vitriolum Cæruleum*, or elſe removed with the Sciſſors or *Scalpel*. The actual Cautery is here recommended by ſome who give us Inſtances of Cures this Way performed; but the Application of them is not only very inconvenient in the Mouth, but alſo extreamly painful. A remarkable Inſtance of this Diſorder removed by the *Scalpel* is propoſed by MEEKREN, in *Obſ.* XXVIII. and SCULTETUS, in *Obſ.* XXXV. ſays, he happily extirpated an Excreſcence of this kind, which adhered to the Gums cloſe to the Palate behind the anterior Teeth, by applying the Pair of Pliers made for removing *Polypuſes*. And a few Years ago I obſerved one in the Palate behind the *Dentes inciſores*, of a certain Monk, which being accompanied with a *Spina ventoſa* in the Bones of the Palate, and the Patient not willing to admit the Uſe of the Cautery, it at laſt killed him.

CHAP. LXXXVI.

Of Parulides, *or Boils and Abſceſſes of the Gums.*

SOMETIMES a Tumor and Inflammation of the Gums, in various degrees, ariſes from intenſe Pains of the Teeth and Jaws; which inflammatory and painful Tumors are by the *Greeks* termed *Parulides*, and popularly they are denominated Gum-boils. The Treatment of them muſt be conducted like that of other inflammatory Tumors, *viz.* by Diſcutients; but if they fail, or if the Diſorder be neglected, it uſually terminates in an Abſceſs or *Fiſtula*. Therefore if the Tumor be recent, you had beſt abate the Pain, which hinders the Patients from Sleep, by the following Diſcutients, *viz. Chamæmeli*, *Salviæ*, *Flores Sambuci*, &c. boiled in Water or Milk, which ſhould be often taken warm into the Mouth by the Patient, and held therein for ſome time. Externally may be applied Bags filled with the ſame Herbs, or elſe a Plaſter of *Melilot* or *Diachylon*, with *Camphor*. ſecured with a warm Handkerchief, to keep out the Cold, not neglecting diſcutient and diaphoretic Medicines internally. If the Diſorder cannot be thus diſperſed, you will have Occaſion for

[a] An Inſtance of this method of Cure you have in SCULTETUS.

the

the Uſe of emollient Applications, ſuch as Mallows, Marſh-mallows, Mullen, Figs, *&c.* boiled in Milk, and frequently retained in the Mouth. To forward the Maturation externally, you may apply half a roaſted Fig to the Tumor with an emollient Cataplaſm ſecured upon the outſide of the Cheek. When the Softneſs of the Tumor denotes its having come to Suppuration, you ought immediately to open it by Inciſion, to diſcharge the Matter, leſt it ſhould erode the adjacent Bone, or produce a ſtubborn *Fiſtula*; the contained Matter may be diſcharged after your Inciſion, partly by preſſing with the Fingers, and then with warm Wine, or a Decoction of vulnerary Herbs mixt with *Mel Roſar.* which ſhould be alſo uſed as a Gargle, till the Parts are well cleanſed and healed. When the Ulcer penetrates deep, it will be neceſſary to inject this Decoction by a Syringe; and, after diſcharging the Liquor again, a Compreſs is to be ſecured upon the Bottom of the Ulcer with a Bandage, to make that Part unite firſt. But when the Ulcer degenerates into a *Fiſtula*, accompanied with a *Caries* in the Bone, you ought then, after each Injection, to apply a little *Tinct. Myrrh. vel Elix. Proprietat.* to deterge the Parts, and diſpoſe them for healing; by which method I have frequently cured not only ſimple Ulcers of the Gums, but alſo thoſe which have been accompanied with a *Callus* or *Caries*, and of above a Year's ſtanding. But if all theſe Medicines prove ineffectual, the *Fiſtula* muſt be laid open by Inciſion, and the *Caries* removed either by Medicines, the Raſp, or the actual Cautery, as we have directed before in Part I. Book V. Chap. VIII. Sometimes a *carious* Tooth occaſions the *Fiſtula* of the Gums, which therefore ought to be firſt extracted, before the Application of the proper Medicines. There are ſeveral Obſervations upon theſe Diſorders in the *Miſcellanea Berolinenſia*; from whence it appears, that ſuppurating Medicines are of little or no Service; and that if theſe Tumors are not quickly laid open by Inciſion, and the Tooth extracted, they degenerate into obſtinate *Fiſtulæ*; ſo that it is much the beſt to be rather too early than late with your Inciſion, in order to diſcharge the Matter, though crude, rather than let it ſpread the Diſorder, ſo as to affect the Bone, under a Notion of bringing it to Suppuration. For more on this Subject, the Reader may conſult an accurate Diſſertation *De Epulide & Parulide*, publiſhed by SCHELHAMMER, *An.* 1692.

Of Chirurgical Operations in the Tongue.

CHAP. LXXXVII.

Of depreſſing the Tongue.

THERE are many inflammatory Diſorders of the Mouth, Palate, Tonſils, *Uvula*, and *Fauces*; alſo Tumors, Abſceſſes, *&c.* in thoſe Parts; which require a Depreſſion of the Tongue to inſpect and treat with proper Remedies. To perform this, the Inſtrument termed *Gloſſoſpatha*, or *Speculum Linguæ*,

Tab. I.

Tab. I. *Lit.* P, has been generally uſed: But the nicer Patients, who do not care to have another Man to inſpect their Mouth by this Inſtrument, make uſe of the flat Handle of a Silver Spoon, with more Neatneſs and Convenience; but the Application of either of theſe Inſtruments ſhould be made very gently, to avoid giving the Patient Pain, and that you may not irritate the inflamed Parts: So when there is Occaſion for any Injections, the Syringe is to be conveyed into the Mouth, over the Handle of the *Spatha* or Spoon; if there be any Ulcer of the Mouth, a *Polypus* in the Noſe, or any Diſorder in the Tonſils, in which the Mouth cannot be ſufficiently opened, you may then make uſe of the *Speculum Oris*, *Tab.* XX. *Fig.* 12 or 13.

CHAP. LXXXVIII.

Of dividing the Frænulum *of the Tongue.*

When the Operation is neceſſary.

I. THE Tongue is ſometimes tied down too cloſe to the Bottom of the Mouth by a Ligament connected all along to its middle, uſually termed its *Frænulum*, which requires to be inciſed or divided, to give this Organ its proper and free Motion. This Diſorder generally ariſes in Infants ſoon after their Birth; ſo that they cannot move and properly exert their Tongues in the Action of Sucking; though it is ſometimes alſo obſerved in Adults; and in both requires the Care of the Surgeon. However, it may be obſerved, that this Operation is not neceſſary in all new-born Infants promiſcuouſly, as many Nurſes and Midwives imagine; for it is hardly neceſſary in one among a thouſand of them, and is a Diſorder not ſo often met with as the Hare-lip, as hath been frequently obſerved by myſelf and many other prudent Phyſicians. When the Infant can put the Tongue out of its Mouth, the *Frænulum* does not require any Inciſion; for that Organ may be then capable both of ſucking and ſpeaking, when there is no other Impediment; but when the Tongue cannot be extended out of the Mouth beyond the Teeth, it may be then indeed neceſſary to divide the *Frænulum*, or other Membrane, by which it is too cloſely connected. But as this Operation is ſometimes attended with bad Accidents, and even the Death of the Infant, when raſhly performed, we ſhall make it our Buſineſs, in this Place, to deſcribe the proper method in which the ſame ought to be executed.

Method of Inciſing.

II. Firſt, the End of the Tongue is to be covered with a Linen Cloth, and held betwixt the Fingers to prevent it from ſlipping, as in *Tab.* XXI. *Fig.* 1. or elſe the Tongue may be elevated by a kind of Fork for the Purpoſe, *Tab.* XXI. *Fig.* 2. *and* 3. or *Tab.* I. *Lit.* O or P; after which, the Ligament of the Tongue running betwixt the ranular Veins and inferior ſalival Ducts, is to be divided with a Pair of obtuſe pointed Sciſſors, *Tab.* I. *Lit.* C, or with a *Scalpel*, till you think it free enough for ſucking and ſpeaking. But, in dividing the Ligament, you muſt be careful to avoid wounding any of the ſalival Ducts, or the proper Veins and Nerves of the Tongue: For Dionis, in his *Surgery*, mentions an Infant who expired, ſoon after the Operation, by a profuſe Hæmorrhage from the ranular Veins; and therefore, if you ſhould wound one of

theſe, a Compreſs muſt be applied under the Tongue, which has been firſt dipt in Vinegar. If the Tongue is not ſufficiently freed by this Operation at the firſt Time, you may make a farther Diviſion of the Ligament a few Days after, treating the Wound afterwards with *Mel Roſar.* frequently applied by a Feather, to prevent the lately inciſed Parts from adhering again to each other.

Scholium. III. From what has been ſaid, it appears that this Operation is ſeldom neceſſary, and ſometimes of dangerous Conſequence; ſo that thoſe Midwives juſtly deſerve to be cenſured, who always thruſt their Fingers into the Infant's Mouth, in order to lacerate this Ligament ſoon after the Birth; for the Inflammation, and other bad Conſequences induced by this raſh Practice, may not only throw the Child into Convulſions, but may even prove the Cauſe of its Death: So that when ſuch a Diviſion of the *Frænulum* is neceſſary, as it is not very often, it ought to be cautiouſly inciſed with a *Scalpel* or Pair of Sciſſors, and not roughly lacerated with the Finger-Nails; the bad Conſequences of which may be ſeen related more at large in HILDANUS, *Cent.* 3. *Obſ.* 28.

CHAP. LXXXIX.

Of a Ranula *or Tumor, and* Calculi *under the Tongue.*

Deſcription. I. THE Term *Ranula* is generally uſed to ſignify a Tumor or Abſceſs under the fore-part of the Tongue on either Side, near the Veins of that Name. The Matter contained in theſe Tumors is various, being ſometimes a tenacious and mucous Lymph, ſometimes a thicker and purulent Matter, and ſometimes of a hard and ſtony Conſiſtence. The Tumor itſelf often grows very faſt, and not only impedes the Speech and Deglutition of the Patient, but alſo frequently excites moſt acute Pains. Sometimes indeed we meet with a ſort of fleſhy Tubercles in this Part, which are more dangerous as they are painful, becauſe they ſometimes degenerate into a Cancer, as I have more than once obſerved. Infants are generally more infeſted with Tumors in this Part than Adults; nor can they be eaſily removed, through the Difficulty of applying and retaining Medicines to them; and it is alſo ſtill more difficult to bring a *Ranula* to Suppuration for the ſame Reaſons; ſo that the only Relief to be had, muſt be expected from the Hand of the Surgeon.

Cauſes. II. As theſe Tumors are much of the ſame Nature with thoſe of the encyſted kind, it will be beſt to extirpate them in the ſame manner, as we have before directed in Chap. XXVIII. but then you will not find it ſo eaſy to remove theſe; partly from the Difficulty of retaining Medicines, and partly from the frequent Cryings of the Infant, which laſt may render the Operator very liable to wound the Nerves, Blood-veſſels, and ſalival Ducts of the Tongue, which would be followed with intenſe Pain, Inflammation, profuſe Hæmorrhage, and perhaps Convulſions, or the Death of the Infant. It will therefore be much ſafer to turn the Tongue upwards, and make a tranſverſe Inciſion upon the Tumor, ſo as to diſcharge its included Matter; after which you may deterge or deſtroy the remaining Tunic with *Mel Roſar.* ſharpened with *Sp. Vitriol.* and

then

then the Cure may be eaſily compleated with *Tinct. Myrrh.* and ſimple *Mel Roſar.* or a Mixture of Oil and Sugar. Sometimes the Tubercle breaks of itſelf, without the Uſe of any Inſtrument or Medicine; and then you muſt deterge and heal the Ulcer as before. Sometimes the ſmall Glands under the Tongue appear much enlarged with Pain and Inflammation; and then the Patient ought frequently to retain warm Milk, or half a roaſted Fig in his Mouth upon the Parts affected, with an emollient Cataplaſm and Plaſter applied under his Chin, that the Tumor may be either diſperſed or ſuppurated; in which laſt Caſe it muſt be inciſed, deterged, and healed, as we before directed for Abſceſſes in the Gums, Chap. LXXXV. I have ſometimes obſerved a Tumor of this kind under the middle of the Tongue, where the ſalival Ducts open into the Mouth; and in this you ought not to make any Inciſion, to avoid injuring thoſe Ducts, or the adjacent Nerves or Blood-veſſels; but you ought rather patiently to wait till the Tumor breaks of itſelf, and then you may deterge and heal as before. In cancerous Tumors of this kind, the Patient will hardly ever receive any Benefit from any Operation or topical Remedies whatever. If a ſmall Stone is found in this Part of the Tongue, after making an Inciſion, if it does not fall out of itſelf, you muſt extract it with a Probe or Pair of Pliers, deterging and healing the Wound as before.

CHAP. XC.

Of a Scirrhus *and Cancer in the Tongue.*

I. WHEN Part of the Tongue appears tumified and hardened, without Pain, the Diſorder is ſaid to be a *Scirrhus*; which, by becoming painful, and diſcharging a purulent fetid Matter, gradually degenerates into a Cancer, as we before obſerved in treating of a *Scirrhus*. The Tumor, in itſelf, often appears at firſt no larger than a Pea, or ſmall Hazel-Nut; but ſometimes it grows much larger, and occupies the greateſt Part of the Tongue, being either moveable or immoveable. The Cancer of the Tongue is ſometimes latent and entire, and ſometimes open or ulcerated, diſcharging a putrid and fetid Matter, which gradually deſtroys the Tongue. Sometimes this dangerous diſorder ariſes without any manifeſt Cauſe; but more frequently it proceeds from ſome ſharp or rough Parts of a Tooth, which prick and wound the Tongue; from which Cauſe I have ſometimes ſeen it eroded laterally, and ſometimes from its Tip backwards. *Diagnoſis.*

II. In the Treatment of this Diſorder, you therefore ought firſt to remove the Roughneſs or Inequality of the Teeth, which injured the Tongue, by the Raſp, *Tab.* XX. *Fig.* 22. or ſome other proper Inſtrument, without which the Diſorder will be continually irritated, inſtead of yielding to the Action of Medicines. After having raſped or extracted the Tooth, the Tongue muſt next be treated with *Tinct. Myrrhæ, cum Mel. Roſar.* or with *Balſam. Peruvian. vel de Mechâ.* When the Diſorder ariſes from internal Cauſes, you muſt treat the Patient with the proper internal Medicines uſual for a *Scirrhus* or Cancer; though *Cure.*

though generally they take little or no Effect. There are indeed ſome Tubercles of the Tongue about the Size of a Pea, or a little larger, as I have ſometimes obſerved, which do not always keep of the ſame Size; but being without Pain, they are tolerable for many Years, or even till the Patient dies, without giving any great Uneaſineſs [a]. Theſe are beſt left to themſelves, like many mild *Scirrhi* and Cancers; for the more you irritate them with Medicines, the worſe they generally grow, ſo as frequently to degenerate into an ulcerated Cancer, and deſtroy the Patient. But when a *Scirrhus* of the Tongue grows very large, and very painful, it ought to be extirpated as ſoon as poſſible. If the Tumor is moveable, an Inciſion muſt be made in the Tongue with the *Scalpel*, till you can readily ſeparate the morbid from the ſound Parts; but when immoveable, and not very large, Part of the Tongue ought to be taken off with it. Yet when it is very large, or ſpreads through the whole Root of the Tongue, it is better to relinquiſh the Operation, by which the Cancer cannot be totally extirpated, rather than torment the Patient to no Purpoſe, or haſten his Death; for if a Cancer be not cleanly extirpated, it uſually rages worſe than before. To perform the Operation, an Aſſiſtant muſt be firſt placed behind the Patient, to hold his Head, with two other Aſſiſtants on each Side, to extend and hold faſt the Tongue, either with their Finger and a Cloth, or Pliers like thoſe in *Tab.* XIX. *Fig.* 9 or 10. After you have extirpated the *Scirrhus* or Cancer, the Wound may be healed with *Mel Roſar. & Balſ. Peruv. vel de Mechâ*, deterging with *Tinct. Myrrhæ*, and healing with *Ol. Amygd. dulc. rec. cum Saccharo*, in the Form of a *Linctus*. When the Cure is compleated, the Patient muſt be confined to a proper Regimen and Diet all his Life, with the Uſe of proper Remedies at ſtated Seaſons, to prevent a Relapſe, as we before directed for Cancers. We have a remarkable Inſtance of this Diſorder cured by the expert Anatomiſt RUYSCH, in *Obſ.* 76. in which, having extirpated the ulcerated Cancer of the Tongue by the *Scalpel*, he applied the actual Cautery, and afterwards compleated the Cure, which could not be effected with Cauterization, though it had been ſeveral times extirpated before.

CHAP. XCI.

Of Ulcers in the Palate.

Their Symptoms and Cauſes.

I. WE ſometimes meet with Ulcers in the Palate, which not only deſtroy the adjacent fleſhy Parts, but alſo erode and extend themſelves into the Bones of the Noſe. The Patient afflicted with theſe has not only his Speech vitiated by them, but alſo any Liquor, upon drinking, regurgitates into the Noſe with great Uneaſineſs. Such Ulcers proceed moſtly from a ſcorbutic Acrimony, or a venereal Infection in the Blood; and if thoſe Diſorders are not ſpeedily removed, as their immediate Cauſe, ſuch Ulcers will frequently deſtroy

[a] I knew an Inſtance of ſuch a Tubercle in the Tongue of a learned Man, which has continued in the ſame State for near theſe thirty Years: I perſuaded him not to irritate it with Medicines, but to leave it to Nature.

not

not only the whole Palate, but alſo the ſeveral Parts of the Noſe itſelf, to the great Miſery and Deformity of the Patient.

II. In the Cure of theſe Ulcers you muſt have a principal Regard to the morbid State of the Blood, and firſt correct its venereal or ſcorbutic Acrimony, with proper internal Medicines. If the Palate is not yet perforated by the Ulcer, it will be proper firſt to cleanſe the Parts by frequently injecting a detergent Gargle made of vulnerary Herbs, and mixed either with *Mel Roſar. Ung. Ægypt. vel fuſc. Wurtzii*, as you would have it more or leſs deterging. The Honey that ſwims on the Top of *Ægyptiacum* and the *Aqua aluminoſa Fallopii*, are good detergents in theſe Ulcers, which are accompanied with *Caries*. After theſe Detergents have been uſed ſome time, ſo that the Ulcer appears clean, you may then dreſs with *Mel Roſar. Tinct. Myrrhæ, Elix. Propriet. vel Balſ. Peruv.* applied with Lint. Cure.

III. When the Bones of the Palate are alſo *carious*, the foul Parts will very often ſeparate from the ſound by the Uſe of the aforeſaid Medicines, eſpecially if you ſometimes dreſs with *Mel Roſar.* acidulated with *Sp. Vitrioli:* But when theſe prove inſufficient, you muſt gently apply an actual Cautery to the foul Bone, after you have firſt cleanſed and dried it with Lint, and ſecured the Tongue, by depreſſing it with the *Specillum Oris* or a *Spatula*. After your Cauterization, the Parts muſt be dreſſed with Balſams, till the naked Bone is again covered with Fleſh; but ſometimes thoſe Perforations of the Palate into the Noſe are never cloſed up again, but remain open. When with *Caries*.

CHAP. XCII.

Of ſtopping Perforations of the Palate into the Noſe.

WHEN the Palate is perforated into the Noſe, ſo as to vitiate the Speech, and occaſion Liquors to regurgitate into this Organ upon drinking, your Remedy in this Caſe is to cloſe or ſtop the Perforation as exactly as poſſible by Art, with a proper Inſtrument; ſince you cannot procure the Bone and Fleſh to grow ſo as to fill up the Space. The Patient muſt therefore have a Plate of Silver or Gold adapted to the Perforation, and furniſhed with a Handle or ſmall Tube, which being armed at the Top with a Sponge, as in *Tab.* XXI. *Fig.* 4, 5. he may thereby exactly cloſe the Perforation. The Sponge being inſerted into the Perforation, prevents the Plate from falling down from the Palate, and by that means renders the Patient able to ſpeak and ſwallow, as if his Palate was entire: But he ſhould be provided with two of theſe Inſtruments, that after one has been wore a Day, it may be extracted, waſhed, and dried againſt the next Day, to prevent the imbibed Humours from putrifying and ſmelling. I once ſaw ſuch a Perforation of the Palate, occaſioned by a Bullet in an Officer, which was remedied in this method.

Of

Of Chirurgical Operations on the *Uvula* and Tonſils.

CHAP. XCIII.

Of a Tumor and Prolapſus *of the* Uvula.

Cure by Medicines.

I. THE *Uvula* is ſometimes ſo much enlarged and elongated, as even to reach the *Larynx* and *Pharynx*, and obſtruct the Actions both of Reſpiration and Deglutition, as well as the Speech. If it proceeds from a recent Inflammation, as you may judge from the Pain, Heat, and Redneſs of the circumjacent Parts, the Patient may be relieved with cooling Gargles and Injections of Wine and Water, or a Decoction of proper Herbs with a little Alum, or *Sal Ammoniacum*; but at the ſame time proper Coolers muſt be uſed internally, with Bleeding, Purges, and Clyſters, to prevent the Inflammation from ſpreading through the *Fauces*, and exciting a Quinſy. Scarifications are very uſeful here, both to remove the Inflammation and prevent its ſpreading, as I have long ago experienced both upon myſelf and others. When this Part is too much relaxed and elongated by phlegmatic Humours, it uſually appears white, and free from Pain or Inflammation; and therefore in this Caſe you will find moſt Benefit from a Gargle of warm *Sp. Vini* and Water, or an aſtringent Decoction *ex Flor. Roſar. rub. & Liguſtri, Cort. Granator. &c.* mixt with *Sp. Vini vel Sp. Salis Ammoniaci*. If the Diſorder ſtill continues, another method muſt be taken to remove the phlegmatic Humours by an Aſperſion or Powder *ex Zinzib. vel Piper. cum Cort. Granator.* which may be alſo mixed with Honey, and applied with a Tea-ſpoon, or the Inſtrument in *Tab.* I. *Fig.* 4. not neglecting proper diaphoretic and cathartic Medicines internally at the ſame time.

Cure by Abſciſſion.

II. When the Diſorder ſtill continues, notwithſtanding the Uſe of theſe Remedies, ſo as to obſtruct the Patient's Reſpiration, Deglutition, and Speech, it will then be neceſſary to remove ſo much of the *Uvula* as ſhall appear to be ſuperfluous; which may be taken off ſeveral Ways. The firſt is by Ligature made upon the *Uvula* with an Inſtrument for the Purpoſe, as we have repreſented in *Tab.* XXI. *Fig.* 6. from HILDANUS and SCULTETUS. Firſt a ſtrong Thread A is conveyed through the Hollow of the Inſtrument by the long Needle, *Fig.* 7. ſo as to make a Nooſe with it in the Ring B, through which Nooſe is tranſmitted ſo much of the *Uvula* as ſhall be thought ſuperfluous, and by drawing the Thread C, the Nooſe is firmly contracted; then removing the Inſtrument, the Ligature is left upon the *Uvula*, and by degrees tightened on the following Days, till the inferior and redundant Part of the *Uvula* drops off. But it muſt be confeſſed, that this ingenious method is very tedious and troubleſome both to the Patient and Surgeon. There is a much more ready method than this, by depreſſing the Tongue with a *Spathula*, *Tab.* I. P or R, and then clipping off the redundant Part of the *Uvula* with a Pair of Sciſſors; in performing which the main Point is to extirpate neither more nor leſs than is neceſſary: For if you remove too little, the Patient's Reſpiration will be ſtill impeded,

impeded, and he will be little the better for the Operation; and if you remove too much of the *Uvula*, the Patient's Voice will be vitiated afterwards. But if the Surgeon's Hand is not ſtrong enough to depreſs the Tongue with the *Spathula*, and extirpate Part of the *Uvula* at the ſame time, it will be moſt convenient for him to operate with the Inſtrument contrived by a Countryman of *Norway*, where this Diſorder is very frequent; which Inſtrument is alſo very well deſcribed by BARTHOLIN and SCULTETUS. It conſiſts of a little Kniſe faſtened to a broad Plate of Steel, which is perforated in the fore-part, and by letting looſe a Spring on the Side of the Plate, the Kniſe flies out with great Celerity, and cuts off the redundant Part of the *Uvula*. This Inſtrument has, I think, been reformed by RAW, as in *Tab.* XXI. *Fig.* 8. ſo as to be without any Spring; but the Kniſe C being ſtrongly thruſt forwards through the Stick B B, at once cuts off ſo much of the *Uvula* as you let through the *Foramen* A, the Inſtrument itſelf being held in the Mouth with the left Hand by the Handles D D D, ſo as to depreſs the Tongue ſufficiently at the ſame time, without the Uſe of a *Specillum Oris*.

III. Having thus extirpated the redundant Part of the *Uvula*, the Blood may be permitted to flow a while, and then you may reſtrain it by a Gargle of warm Wine, Vinegar, or *Oxycrate*; and, if it ſtill continues, you may apply a little Alum by the Spoon, *Tab.* I. *Lit.* N. or you may, after the manner of the Ancients, touch it with a hot Iron, but not red, till the Hæmorrhage ceaſes. But when the *Uvula* is alſo infeſted from ſome veneral Cauſe at the ſame time, the Surgeon muſt in the interm treat the Patient with proper internal Medicines before he can expect or obtain a Cure. How to reſtrain the Hæmorrhage.

CHAP. XCIV.

Of Scarifying the Tonſils when inflamed in a Quinſy.

A Violent Inflammation of the Tonſils, eſpecially in a Quinſy, may be juſtly ranked among the more dangerous Diſorders; becauſe we are aſſured from Experience, that it may be followed with a Gangrene and fatal Conſequence; to prevent which we muſt call in the Aſſiſtance of the moſt potent antiphlogiſtic Remedies, ſuch as bleeding in the Arm, Foot, Neck, and under the Tongue, with Scarification of the Tonſils themſelves, beſides the Remedies before propoſed for an Inflammation of the *Uvula*. It was a Practice with the ancient Surgeons to ſcarify, and cup upon the external Parts of the Neck neareſt to the Tonſils; the Uſefulneſs of which I have often experienced. And I am alſo informed by an expert Phyſician, that in *England* they often ſcarify the Tonſils internally, by which means, with the Uſe of proper internal Medicines, drinking Plenty of thin Liquors, and with cooling Clyſters often repeated, the Patient uſually recovers; and therefore it is nothing extraordinary to meet with the ſame Practice among the *French* Phyſicians, as we are told by GARENGEOT in his firſt Edition of his *Surgery*, Tom. II. pag. 456. For the more commodious Scarification of theſe Parts, the Operation is uſually performed with the Inſtrument, *Tab.* XXI. *Fig.* 9. with which the Tongue may be alſo depreſſed

at

at the ſame time, the Lancet or *Pariſthmiotomus* lying concealed. Inſtead of this Inſtrument (which I long ago deſcribed and figured with the Form and Poſition of the *Uvula*, and Tonſils in *Ephem. Nat. Curioſor.* Cent. IV. Obſ. 191.) M. PETIT has contrived one which M. GARENGEOT delineates, almoſt like mine, and ſays it was firſt deſcribed by VALENTINUS in his *Surgery*, when VALENTINUS in *pag.* 102. of his ſaid Book, openly declares me to have been the firſt that deſcribed and figured the Inſtrument.

CHAP. XCV.

Of opening Abſceſſes in the Tonſils.

Cauſes. I. BY the Neglect or Miſmanagement of an Inflammation in the Tonſils, the obſtructing Matter, which ought to have been diſperſed, becomes either concreted or ſuppurated ſo as to form an Abſceſs or *Scirrhus*; and then you ought to forward Suppuration as faſt as poſſible by the Uſe of Gargles internally, and emollient Cataplaſms externally; that the Patient may by this means not be in Danger of Suffocation, or loſing his Speech and Deglutition, by the too great Progreſs and Continuance of the Diſorder; for which Reaſons it is alſo generally unſafe to wait till the Matter makes its own way through the Tumor, but it ought to be diſcharged by Inciſion as ſoon as you can perceive its point, or are ſatisfied there is Matter included; to determine which, requires a ſtrict Examination both by the Eye and Touch.

Method of Aperſion. II. When the Surgeon is aſſured of an Abſceſs in the Tonſils, he muſt inveſt one of the longeſt Lancets he can procure, almoſt up to its Point, with a ſlip of Plaſter, ſo that not above half a Finger's Breadth of its Point may remain uncovered; then depreſſing the Tongue by the *Spathula*, *Tab.* I. *Lit.* P. or by the broad Handle of a Spoon, he next intrudes the End of his Lancet in the moſt promiſing part of the diſeaſed Tonſil; whereupon the confined Matter will break forth, and much relieve the Patient from his intenſe Pains. The Operation may be performed ſtill more commodiouſly by the *Pariſthmiotomus*, or Inſtrument for ſcarifying the Tonſils, repreſented in *Tab.* XXI. *Fig.* 9. becauſe this will both perform the Office of depreſſing the Tongue inſtead of a *Spathula*, and at the ſame time ſcarify or inciſe with its Lancet, which is here concealed, and may therefore be much better uſed for Infants and timorous Patients, who will hardly or not at all admit of the Knife.

Treatment after Inciſion. III. After having opened the ulcerated Tonſils by Inciſion, the Patient muſt gargle ſeveral times in a Day with a Decoction of vulnerary Herbs mixed with Wine or *Mel Roſar.* after it has been firſt made warm; in the Uſe of which he muſt continue till the Parts are healed. In the mean time the Patient muſt ſtrictly abſtain from all ſtrong, ſalt, and ſpicy Aliments, and from all acrid Medicines; leſt any of them, adhering in the Wound, ſhould irritate and excite a new Inflammation, to the Hazard of his Life.

CHAP.

CHAP. XCVI.

Of Extirpating scirrhous Tonsils.

I. THE Tonsils are sometimes so much enlarged and indurated after an Inflammation, as almost to shut up the *Fauces*, and prevent the Patient from either breathing or swallowing, especially when both Tonsils are thus disordered at the same time. 'Tis frequently very difficult, and even impracticable, to disperse such a Tumor of these Parts by the Use of emollient and discutient Remedies; and therefore to relieve the Patient of his Torment, and restore his Deglutition and Respiration, the Surgeon is obliged totally to remove or extirpate them; which may be performed either by Caustic, Incision, or Ligature. Description.

II. With regard to the first method of removing them by Escharotics, great Care must be taken that none of the stronger kinds be here used, lest some Part of them escaping into the Stomach should produce a Disorder worse than the Original. The strongest that can be well allowed here is *Ol. Tartari P. D.* or when that fails, a Mixture of *Aqua fortis* diluted with as much Water as will just render it able to dissolve a small portion of Mercury over the Fire; with these, or such like, the Tonsils are to be touched at Intervals with a Pencil-brush, till they are sufficiently consumed. But in the Application of these Care must be taken not to touch any of the sound Parts, as also not to let the Patient swallow any Food soon after, lest some of the Caustic should be carried down into the Stomach; to avoid both which the Patient should lean over the Bed or Chair with his Head inclined, that the Saliva and Caustic may run together out of his Mouth, observing to wash and gargle his Mouth before eating. And in this Course the Patient must continue till the morbid part of the Tonsils, or so much of them as will restore his Respiration and Deglutition are removed; for it would be not only tedious, but even prejudicial to remove them entirely. Cure by Escharotics.

III. The second method used by the Ancients for removing scirrhous Tonsils is that by Incision or Extirpation with a *Scalpel*, after they have extended and brought them into View by the Hook, *Tab.* VIII. *Fig.* 2. but this Operation is not only too severe and cruel, but also too difficult in the Performance, to come much into the Practice of the Moderns, because of the obscure Situation of the Tonsils. Cure by Incision.

IV. The third and last method of removing scirrhous Tonsils is by Ligature, practised chiefly when the diseased Tonsil hangs as it were by a slender Stalk; in which Case it may be also extirpated without Difficulty by a pair of Scissors or a *Scalpel*. To apply the Ligature for removing them, you are advised to use the Instrument, *Tab.* XXI. *Fig.* 7. which we before recommended for making a Ligature on the redundant Parts of a relaxed *Uvula*. If the Ligature is well made upon the Tonsils, they are said to separate in two or three Days time. The Ends of the Thread or Ligature about the Tonsils are to be secured or fastened on the outside of the Mouth by a piece of Plaster, that they may not slip into the *Fauces*. Mr. CHESELDEN has removed scirrhous Tonsils of this kind by a Ligature, which he conveyed round the Root of the Gland by a bent Probe; but in a scirrhous Tonsil with a broad Root, he perforated the Basis of it with a kind of Needle and double Thread, by tying which above and below, the Tonsil came away, as before. See his *Anatomy*, the third Edition, Page 154. Cure by Ligature.

CHAP. XCVII.

Of Tubercles and Excreſcences in the Fauces, *or near the Tonſils.*

IT will not be neceſſary in this Place to give a prolix Account of the methods for removing Caruncles and Excreſcences in the *Fauces*, or near the Tonſils; becauſe they may be, and uſually are treated in the ſame manner as we before propoſed for removing *Polypuſes* and diſeaſed Tonſils.

CHAP. XCVIII.

Of Extirpating ſcirrhous, maxillary, and parotid Glands.

This Operation neglected hitherto.

I. THOUGH we are furniſhed with various methods of removing ſcirrhous Glands in moſt other Parts of the Body, yet I cannot meet with any Directions for Extirpation of the ſalival, maxillary, and parotid Glands, which are frequently indurated and enlarged to a monſtrous Size, and which require much Care and Attention in their Removal, as they adhere to conſiderable Branches of the carotid Artery. What has been advanced in profeſſed Diſſertations and *Theſes* on theſe ſcirrhous Glands regards their method of Cure by Remedies, and not by Extirpation; and there are even many Surgeons and Phyſicians who aſſert the Extirpation of them to be highly pernicious, or even fatal to the Life of the Patient.

Allowed to be dangerous,

II. I muſt indeed rather commend than diſapprove of the Averſion which many entertain againſt the Operation; for there are ſo many conſiderable Branches of the carotid Artery which paſs through theſe Glands, that in extirpating them the Patient may bleed to Death, if not prevented by the Hand of a ſkilful Operator.

But not always fatal.

III. But it muſt not be imagined, that this Hæmorrhage can never be ſuppreſſed by the Hand of a prudent Operator; or if it ſhould now and then prove impracticable, the Surgeon muſt ſometimes engage in doubtful and dangerous Operations to preſerve the Patient from otherwiſe inevitable Deſtruction; and I can aſſure him I have happily extirpated many parotid and ſub-maxillary Glands, which were much enlarged and indurated, and had been in vain treated a long time with Diſcutients, Eſcharotics, and the methods hereafter mentioned, ſo as to be irritated almoſt into a Cancer.

Method of Operating.

IV. For the Operation, you muſt be firſt provided with a good Styptic Liquor, with a large Quantity of Lint, Linen Rags, and ſome *Boviſta*, or Puff-ball, as alſo ſome thick Compreſſes each larger than the other, and a Roller of about ſix Ells long. Theſe being provided, the Patient is to be ſeated againſt the Light with his Head and Hands ſecured by Aſſiſtants, and then the Surgeon opens the Integuments by a longitudinal Inciſion with the *Scalpel*, and after freeing them carefully from the Tumor, he at laſt divides their connecting Arteries with the *Scalpel*. Hereupon the Blood ruſhes forth ſo impetuouſly, that near a Pound will be loſt before the Surgeon can lay down his Knife, and apply the Dreſſings. Therefore to ſave the Patient, and ſuppreſs the Hæmorrhage, he muſt inſtantly apply a Bundle of the Linen Rags dipt in Styptic, and preſs them cloſe upon the divided Arteries. The remaining Cavity of the Wound muſt be well filled with dry Lint and Rags preſſed cloſe with his Fingers, over which muſt be impoſed a large piece of Puff-ball with three or four

four Compreſſes each larger than the other, the whole being at laſt ſecured by the *Faſcia nodoſa* commonly uſed for Arteriotomy in the Temples. Laſtly, you may obſerve that when the Tumor is uncommonly large, it may be more convenient to make a cruciform Inciſion through the Integuments, by which you may extract the Tumor more eaſily than by a longitudinal one.

Treatment after the Operation.

V. After the Operation is concluded, and the Patient put to Bed, an Aſſiſtant ought to ſit by the Bed-ſide, and firmly compreſs the Dreſſings on the Wound for ſeveral Hours with his Hands, the more effectually to reſtrain the Hæmorrhage; after which the Patient ſhould keep his Bed quietly for three or four Days, without removing the Dreſſings, for fear of a freſh Hæmorrhage. The Importance of which laſt Caution I once experienced by relaxing the Bandage a little, through Impatience, the next Day after the Operation; whereupon enſued ſuch a violent Hæmorrhage, though the Bandage was not half off, that I thought we ſhould have loſt the Patient, who was a Girl; and I was therefore obliged immediately to re-apply the looſened Parts of the Bandage tighter than before.

Cure of the Wound.

VI. After the third or fourth Day you may venture to remove gently the Bandage and Compreſſes, which will be filled with the putrid Blood, and where any Parts of them adhere, you muſt moiſten them with warm Wine or its Spirit, and then you may take off the Puff-ball, with ſuch Parts of the Lint and Rags as are looſe: This done, you muſt re-apply Compreſſes dipt in warm *Sp. Vin. camph. & Aqu. calc.* and ſecure them with the ſame Bandage as at firſt, only not ſo tight, that the Patient may take his Aliment with more Eaſe than before. The ſecond and third Dreſſings after the firſt ſhould be performed every other Day, and the reſt every Day, becauſe the Diſcharge will be greater. But in every Dreſſing you ought to remove no more of the Puff-ball, Lint, or Rags, than are quite looſe, ſupplying the Place of the laſt with freſh Lint, ſpread with ſome digeſtive Ointment: And thus you are to proceed till all the Puff-ball, Lint, and Rags, are digeſted off ſpontaneouſly without any Evulſion; which may be generally performed within eight or ten Days. The Wound muſt be now incarned by dreſſing with digeſtive Ointments and vulnerary Balſams, and the Cicatriſation of it finiſhed by Dreſſing with dry Lint only. Laſtly, you ought to obſerve in the Operation to make your Inciſion behind the Jaw, that the Cicatrix may not diſfigure the Patient's Face.

M. Garengeot cenſured.

VII. 'Tis ſomething extraordinary that M. Garengeot, who is ſo ample in other Points of Surgery, ſhould take little or no Notice of the methods to ſuppreſs the Hæmorrhage in his Chapter on the Extirpation of ſcirrhous Glands. He even falſly aſſerts there, that you will not have any Occaſion for Medicines to ſtop Blood in the Extirpation of thoſe Glands, or of ſcirrhous Breaſts, becauſe only a few Drops of Blood will be ſpilt even in removing the largeſt of theſe Tumors, and the Wound itſelf too, he ſays, you may heal very eaſily, provided you cloſe the Lips of it well by Suture. But I think it is from hence very apparent that, in the general Doctrine of that Chapter, he had either no Regard at all to the Extirpation of ſcirrhous Parotids, or elſe he never ſaw the Operation performed; though he affirms he was very frequently preſent at the Operations of the moſt expert Surgeons in *Paris*. Had M. Garengeot ever been preſent at the Extirpation of a Parotid, he would not have affirmed it ſo eaſy to ſtop or reſtrain the Hæmorrhage, and heal the Wound. Hence we may alſo ſee the pernicious Conſequence of writing in general terms, without Speci-

Specifications or Exceptions; for ſhould any one be as careleſs of the Hæmorrhage in extirpating a ſcirrhous Parotid, as one would think he might from M. GARENGEOT's Writings, the Patient would be inevitably loſt, as happened to a Surgeon at *Jene* in this Operation [a]; though I will not deny but his Aſſertion may hold in the Extirpation of moſt other ſcirrhous Glands in the Body. We may from hence alſo conclude, that this is an unuſual Operation at *Paris*; but we meet with the Extirpation of ſcirrhous Parotids performed among the *Dutch* by ROONHUYSE (*Obſ.* 1.) and TILINGIUS in his Additions to SCULTETUS (*Auct.* II. pag. 39, *and* 54.) which were publiſhed at *Leyden* before the Year 1693.

Cure by external Medicines.

VIII. But after all, the prudent Surgeon will not be over-haſty to undertake this dangerous Operation, before the more gentle methods have been tried in vain, becauſe we frequently find that Indurations and Tumors of thoſe Glands, both in Infants and Adults, are often diſperſed by the Uſe of proper Medicines, eſpecially when they are not inveterate, or of long Standing; and therefore the Uſe of Medicines ſhould always be called in before the Knife. It will be often found extreamly ſerviceable in theſe Tumors to bathe them every Day with ſome of the warm Oils, as the *Ol. Laterum*, *Saponis*, *Camphoræ*, *Succini*, *Juniperi*, *&c.* defending them afterwards with a Mercurial or Soap Plaſter, to diſperſe the indurated and obſtructing Matter, which may be alſo promoted by the frequent Application of warm Bags filled with diſcutient Herbs.

Internal Medicines.

IX. In the mean time you muſt alſo take in the Aſſiſtance of internal Medicines, from whence the greateſt Part of the Cure is to be expected; ſuch as Decoctions of the *Rad. Vincetox. aut Scrophular. cum Pulv. è Spongiâ uſtâ*, *Sal. Gemmæ*, *Ant. diaphoret. &c. Calomel* and *Æthiops* I have experienced great Effects from, in theſe Caſes, obſerving to give the Patient a lenient Purge at Intervals; and when all other Remedies take no Effect, if the Patient is willing you may try a Salivation, which I have in many Caſes experienced to be highly ſerviceable in removing Obſtructions and Indurations of theſe Glands.

Treatment by Cauſtics and Suppuration.

X. If a Scirrhoſity of theſe Glands is accompanied with an Inflammation, and you cannot diſperſe the ſame, it may not be improper to ſtrive to bring it to Suppuration, and then to treat the Tumor as an Abſceſs; for I have known ſeveral Inſtances in which ſcirrhous, parotid, and ſub-maxillary Glands, with Concretions in the Neck, having been treated with Diſcutients, in order to diſperſe them, have, by that means, degenerated into Abſceſſes. But when Scirrhoſities of this kind are inveterate, emollient and ſuppurative Medicines will, inſtead of digeſting them, frequently encreaſe the Tumor, and at laſt convert it into a Cancer, or a malignant Ulcer, which are alſo the uſual Conſequences of treating them with Eſcharotics or Cauſtics; which laſt can never be uſed without inducing a Cancer, a dangerous Hæmorrhage, and probably the Death of the Patient, as I had lately an unhappy Inſtance in a Perſon of Quality.

[a] This Caſe is deſcribed at large in the *Commerc. Lit. Norimberg. An.* 1733. *pag.* 61. where the Author obſerves that we may from thence ſee how much ſafer it is to relinquiſh than to extirpate theſe Tumors, which however ought not to deter prudent Surgeons from the Operation when abſolutely neceſſary; for I have frequently performed it with Succeſs, without loſing one of my Patients therein.

The End of the Firſt Volume.